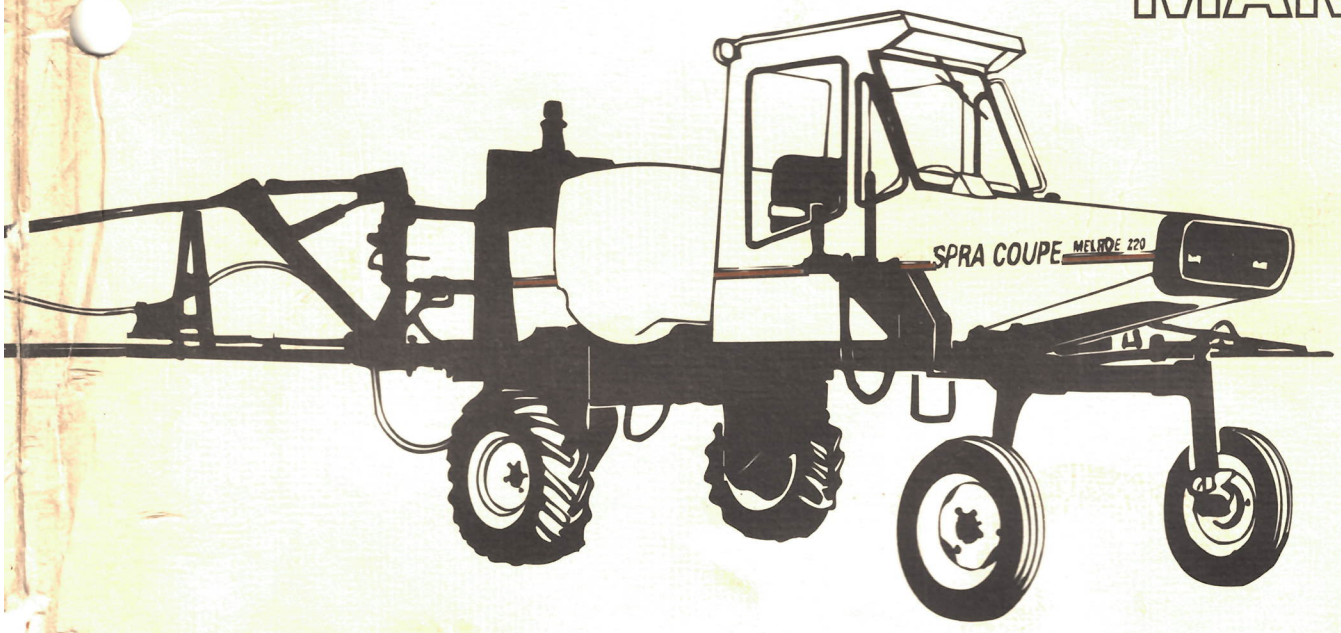
SPRA-COUPE

MODEL 220

OPERATION & MAINTENANCE MANUAL



MELROE COMPANY

A BUSINESS UNIT OF CLARK EQUIPMENT COMPANY

521 S. 22nd St. • Box 1215 • Bismarck, North Dakota 58502 • 701-222-5000

SERVICE ASSISTANCE

Your dealer is vitally interested in your complete satisfaction with the Spra-Coupe you purchased from him. He is anxious to see that all your maintenance and service needs are quickly and courteously completed. If you have questions, always check with your dealer.

To assist your dealer in this effort, Melroe has established district and regional managers throughout the U.S. and Canada. Should you feel that you require service assistance beyond that which your dealer is providing, the district or regional manager in your area will be pleased to work with you and your dealer.

WARRANTIES

The general warranty covering the Spra-Coupe and attachments are stated in detail in the Warranty Policy. Read this policy carefully; it states in precise terms everything that is covered in the warranty.

WARRANTY

SPRA-COUPE AND ATTACHMENTS

(SOLD AFTER AUGUST 1, 1990)

The Melroe Company warrants to its authorized Spra-Coupe dealer, who in turn, warrants to the original buyer (Owner) that each new Spra-Coupe or Melroe attachment will be free from proven defects in material and workmanship for twelve (12) months or 1000 hours (whichever comes first) after delivery to the Owner.

In addition, Melroe warrants to their authorized dealer, who in turn warrants to the Owner, that the driveline in the Melroe Spra-Coupe will be free from proven defects in material and workmanship for twenty-four (24) months after delivery to the original buyer, or 1000 hours of use, whichever occurs first. This warranty shall include the cooling system, engine (including head, block and other basic engine components), transmission and final drives. Repair or replacement will exclude tires, tubes and batteries, normal maintenance items or adjustments such as but not limited to filters, fluids, belts, brake linings, engine clutches or engine tune ups, fuel systems, when such replacements and adjustments are made for the purpose of maintenance of this unit.

This warranty does not cover damages resulting from abuse, accidents, alterations, airflow obstructions, or failure to maintain or use the Melroe product according to instructions applicable to it.

During the warranty period, the authorized Melroe dealer shall repair or replace, at Melroe's option, without charge for parts and labor any part of the Melroe product which fails because of defects in material and workmanship. The Owner shall provide the authorized dealer with prompt written notice of the defect and allow reasonable time for replacement or repair. Melroe (at its option) may request failed parts to be returned to the factory. Travel time of service technician and/or transportation of the Melroe product to the authorized servicing dealer for warranty work are the responsibility of the Owner.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES (EXCEPT THOSE OF TITLE), EXPRESSED OR IMPLIED, AND THERE ARE NO WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL THE AUTHORIZED SELLING DEALER OR MELROE BE LIABLE FOR DOWNTIME EXPENSES, LOSS OF MACHINE USE OR OTHER INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES.

Printed in U.S.A

FOREWORD

This manual has been prepared for the owners and operators of the Melroe Spra-Coupe. Read the manual carefully and become familiar with all instruments and controls. Learn the safest operating and maintenance techniques for the Spra-Coupe. To find a section, place thumb on tab and turn pages until desired section is reached.

This manual is part of your Spra-Coupe. Keep it in the vehicle at all times as a ready reference for anyone who may operate the Spra-Coupe. If the manual is damaged or lost, a replacement manual can be purchased from your Melroe Spra-Coupe dealer.

As you would with all quality equipment, keep your Spra-Coupe in good working order. This manual provides essential information for proper service and periodic maintenance, including charts with machine specifications and capabilities.

Because Melroe offers a variety of options and accessories, illustrations in this manual may picture the Spra-Coupe equipped other than standard.

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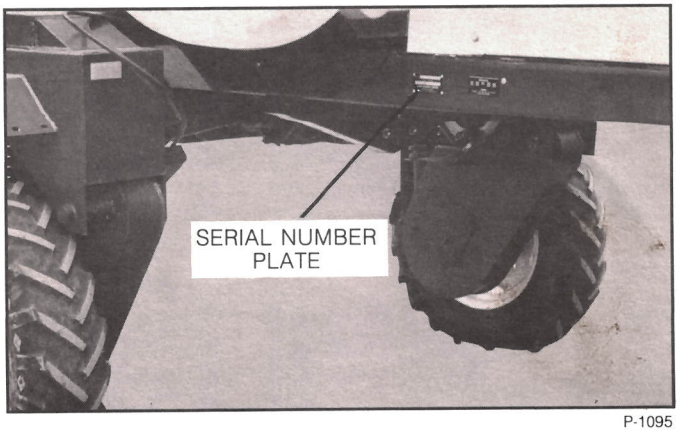
REFERENCE INFORMATION

Engine Serial Number _____

Spra-Coupe Serial Number _____



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YOUR SPRA-COUPE DEALER: _____

ADDRESS: _____

PHONE: _____

SAFETY INSTRUCTIONS

A. SAFETY IS THE OPERATOR'S RESPONSIBILITY

The Spra-Coupe is a field chemical spray applicator. In operation, it is rugged and useful under a wide variety of conditions. This presents the operator with hazards associated with off highway, rough terrain applications. The Spra-Coupe has an internal combustion engine with resultant heat and exhaust. All exhaust gases can kill so the Spra-Coupe must be used with adequate ventilation.

The dealer explains the capabilities and restrictions of the Spra-Coupe. The dealer demonstrates the safe operation of the Spra-Coupe according to Melroe's instructions materials which are also available to the operator. The dealer can also identify unsafe modifications or use of unapproved attachments.

The following publications provide information on the safe use and maintenance of the Spra-Coupe attachments.

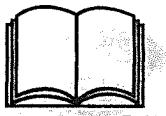
- The Delivery Report is used to assure that complete instructions have been given to the new owner and that the machine is in safe operating condition.
- The Operator's Manual delivered with the Spra-Coupe gives operating information as well as routine maintenance and service procedures. It is a part of the Spra-Coupe and must stay with the machine when it is sold. Replacement Operator's Manuals can be ordered from your Spra-Coupe dealer.
- The Spra-Coupe has machine signs (decals) which instruct on safe operation and care. The signs and their locations are shown in the Operator's Manual. Replacement signs are available from your Spra-Coupe dealer.

The dealer and owner/operator review the recommended uses of the Spra-Coupe when the Spra-Coupe is delivered. If the owner/operator will be using the Spra-Coupe for a different application than was originally demonstrated by the dealer, ask the dealer for recommendations on the new use.

B. BEFORE OPERATING THE SPRA-COUPE

This safety symbol is used for important safety messages. When you see this symbol, follow the safety message to avoid personal injury or death.

⚠ WARNING **Operator must have instructions before running the machine. Untrained operators can cause injury or death.**
W-2001-1285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The Spra-Coupe must be in good operating condition before use.

Check all of the items on the Service Schedule under 8 - 10 hour column.

⚠ WARNING
Warnings on the machine in the manuals are for your safety. Failure to obey warnings can cause injury or death.
W-2044-1288

IMPORTANT
This notice identifies procedures which must be followed to avoid damage to the machine.
I-2019-0284

C. SAFE OPERATION NEEDS A QUALIFIED OPERATOR

A. QUALIFIED OPERATOR* MUST DO THE FOLLOWING:

1. UNDERSTAND THE WRITTEN INSTRUCTIONS, RULES AND REGULATIONS

   a. The written instructions from Melroe Company include the delivery report, Operator's Manual and machine signs (decals).

   b. Check the rules and regulations at your location. The rules may include any Federal and State safety requirements for chemical applicator.

2. HAVE TRAINING WITH ACTUAL OPERATION

   a. Operator training must consist of a demonstration and verbal instruction. This training is given by your dealer before the Spra-Coupe is delivered.

   b. The new operator should start in an area without bystanders and use all the controls until he can operate the Spra-Coupe safely under all conditions of the work area. Always fasten seat belt before operating.

3. KNOW THE WORK CONDITIONS

   a. The operator must know any prohibited uses or work areas. He needs to know about excessive slopes.

   b. Wear protective clothing as recommended by the chemical manufacturer. Always wear safety goggles when maintaining or servicing Spra-Coupe.

* For an operator to be qualified, he must not use drugs or alcoholic drinks which impair his alertness or coordination while working. An operator who is taking prescription drugs must get medical advice to determine if he can safely operate a machine.

FIRE PREVENTION

The Spra-coupe has several components which are at high temperatures under normal operating conditions. The electrical system, if damaged or incorrectly maintained, can be a source of arcs or sparks.

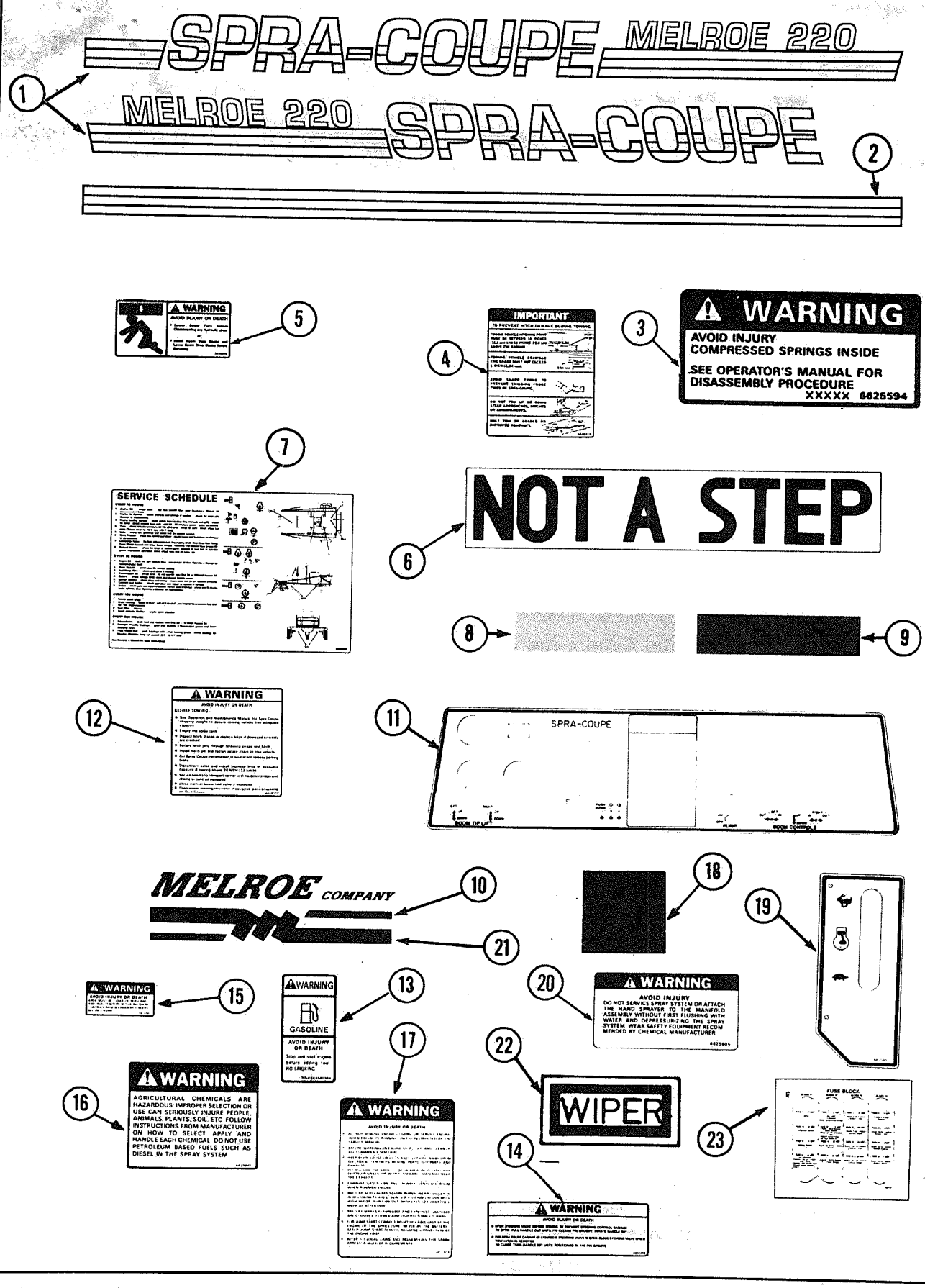
Flammable debris (leaves, straw, etc.) must be removed regularly. If flammable debris is allowed to accumulate, it will increase the fire hazard. The Spra-Coupe must be cleaned as often as necessary to avoid this accumulation. Flammable debris in the engine compartment is a fire hazard when the Spra-Coupe is parked with a hot engine.

The spark arrestor muffler is designed to control the emission of hot particles from the engine and exhaust system, but the muffler and the exhaust gases are still hot. This spark arrestor muffler does not change the need to avoid use of the Spra-Coupe where the exhaust can contact flammable material.

- The engine compartment and engine cooling system must be inspected every day and cleaned if necessary to prevent fire hazard and overheating.
- Check all electrical wiring and connections for damage. Keep the battery terminals clean and tight. Repair or replace any damaged parts.
- Check fuel and hydraulic tubes, hoses and fittings for damage and leakage. Never use open flame or bare skin to check for leaks. Tighten or replace any parts that show leakage. Always clean fluid spills. Do not use gasoline or diesel fuel for cleaning parts. Use commercial nonflammable solvents.
- Always clean the Spra-Coupe and disconnect the battery before doing any welding. Cover rubber hoses, and all other flammable parts. Keep a fire extinguisher near the Spra-Coupe when welding. Have good ventilation when grinding or welding painted parts. Wear dust mask when grinding painted parts. Toxic dust or gas can be produced.
- Stop the engine and let it cool before adding fuel. No smoking.
- Use the procedure in Operator's Manual for connecting the battery.
- Use the procedure in Operator's Manual for servicing the spark arrestor muffler every 100 hours of operation.

RULES FOR SAFE USE OF CHEMICALS

- Always read the label before using chemicals. Follow instructions from chemical manufacturer on how to select, use and handle each chemical. Note protection information each time before opening the container.
- Verbal warnings must be given if written warnings cannot be understood by workers.
- Do not spill chemicals on skin or clothing. If chemicals are spilled, remove contaminated clothing immediately and wash skin (and clothing) thoroughly with soap and water. Wash hands and face with soap and water and change clothing after spraying. Wash clothing each day before reuse.
- The spray tank and system should be emptied of chemical mixture and flushed with clean water before servicing the spray system or spraying components.
- Avoid inhaling chemicals. When directed on the label, wear protective clothing, face shield or goggles.
- Never smoke while spraying or handing chemicals.
- Cover food and water containers when spraying around livestock or pet areas.
- If symptoms of illness occur during or shortly after spraying, call a physician or go to a hospital immediately.
- Follow label directions and advise to keep residues on edible portions of plants within the limits permitted by law.
- Keep chemicals out of the reach of children, pets and unauthorized personnel. Store them outside of the home away from food and feed and lock them in a secure area.
- Keep bystanders away from spray drift.
- Always store chemicals in original containers and keep them tightly closed. Never keep them in anything but the original container. Read labels for hazards about chemical reaction with certain types of metals.
- Always dispose of empty containers according to manufacturer's directions.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MELROE 220 SPRA-COUPE
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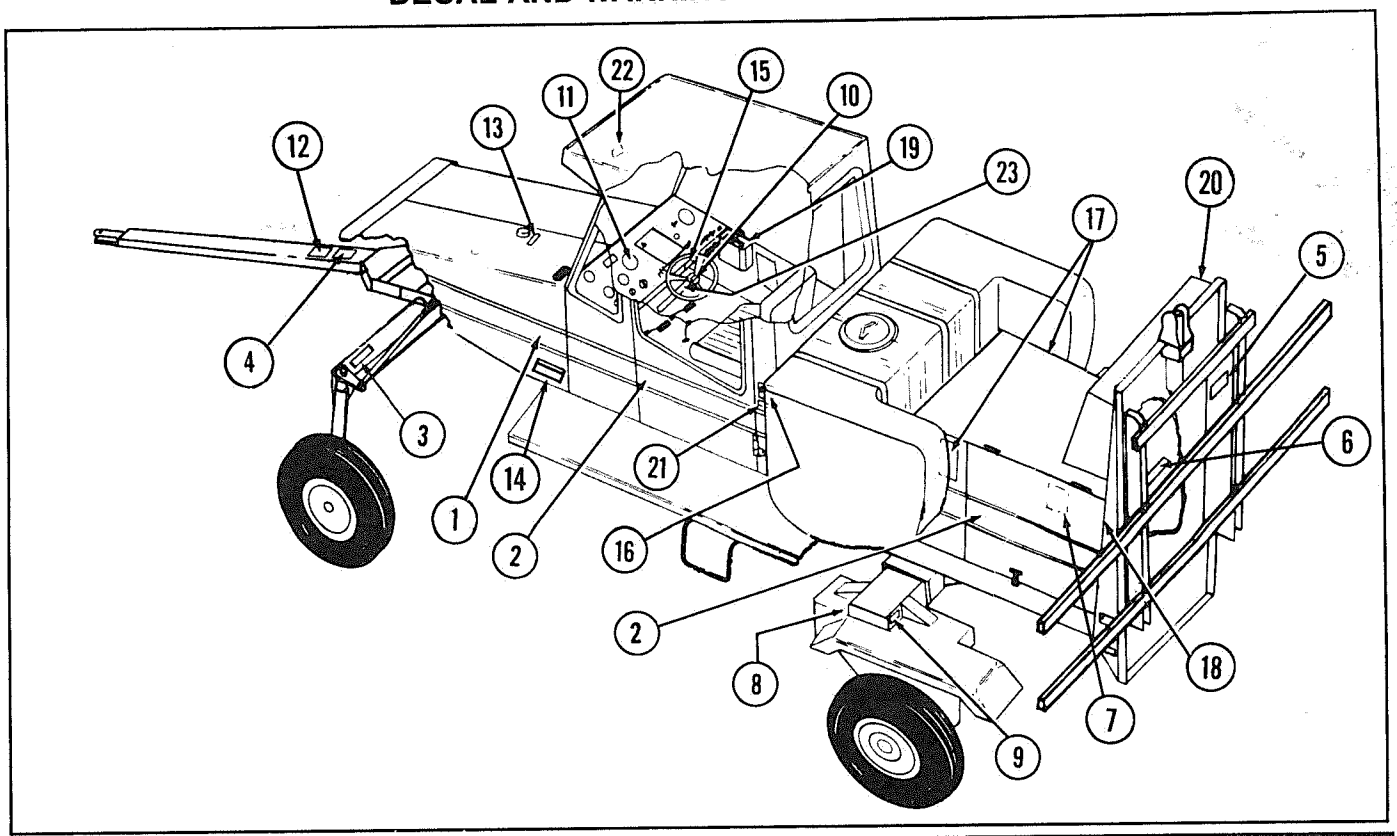
DECAL AND WARNING SIGN LOCATION



⚠ WARNING **Keep safety signs (decals) and reflectors in good condition. Replace immediately if missing or damaged. Replacement signs (decals) and reflectors are available from your dealer.**

DECALS

REF.	PART NO.	DESCRIPTION	QTY.
1.	6627243	Decal, Spra-Coupe (R.H.)	1
	6627242	Decal, Spra-Coupe (L.H.)	1
2.	6627113	Decal, Band 99" (251.5 cm) (One side cut to fit)	2
3.	6625594	Decal, Warning (Spring disassembling on wide front wheel machines only)	2
4.	6626219	Decal, Towing	1
5.	6618240	Decal, Warning (Servicing hydraulic boom system)	1
6.	6623725	Decal, Not A Step	1
7.	6625608	Decal, Spra-Coupe Service Schedule	1
8.	6612233	Reflector, Amber	2
9.	6612234	Reflector, Red (Located also on Rear Boom Gusset - Exposed to Rear w/Booms Folded)	4
10.	6625524	Decal, Melroe Horn Cap	1
11.	6617405	Decal, Dash	1
12.	6626170	Decal, Tow Warning	1
13.	6561384	Decal, Gasoline Warning	1
14.	6618206	Decal, Steering Valve Warning	1
15.	6625602	Decal, Boom Warning	1
16.	6625601	Decal, Chemical Danger	1
17.	6625604	Decal, Engine Warning	2
18.	6620015	Decal, Boom Locator Strip 2x2	2
19.	6625607	Decal, Hand Throttle	1
20.	6625605	Decal, Servicing the Spray System	1
21.	6625523	Decal, Melroe	1
22.	6625536	Decal, Wiper	1
23.	6618243	Decal, Fuse Block	1

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BEFORE OPERATING OR TOWING THE SPRA-COUPE

Before operating or towing the Spra-Coupe, the operator must read this manual, study the safety precautions and have a thorough understanding of the correct operation of the machine.

☛NOTE: "Left" and "Right" are referred to as viewed from the rear of the machine.

Weights and measures in parenthesis ( ) are the equivalent metric conversions.

TOW AND STEERING VALVE OPERATION

The tow and steering valve **[A]** is located in front of the footboard on the left side of the Spra-Coupe.

The valve must be in correct operating position before towing and before driving the Spra-Coupe.

Before towing the Spra-Coupe, the steering valve **[A]** must be "open" to prevent steering control damage.

To open the steering valve:

Pull valve handle out until pin **[A]** clears the pin groove then turn 90° clockwise (or counterclockwise) as shown **[A]**.

To check:

a). Install the transport hitch and pull side to side to turn the front wheels. The front wheels should turn with no resistance caused by the power steering system or...

b). Rotate the steering wheel. The steering wheel should turn freely, with no movement of the front wheels.

Before driving the Spra-Coupe, the steering valve **[B]** must be "closed." If the valve is open, the Spra-Coupe cannot be steered.

To close the steering valve:

Turn valve handle clockwise (or counterclockwise) 90° until pin **[B]** is positioned in the pin groove as shown **[B]**.

To check:

a). Rotate the steering wheel. If front wheel movement is noted, the valve is in the "closed" or in the operating position. If the steering wheel rotates freely with no movement of the front wheels, the valve is in the "open" or in the transport position and must be closed before operating the Spra-Coupe.

⚠ WARNING

AVOID INJURY OR DEATH

- **Open steering valve before towing.**
  To open:
  Pull valve handle out until pin clears the pin groove, then turn 90° clockwise (or counterclockwise).
- **The Spra-Coupe cannot be steered if steering valve is open. Close valve when tow hitch is removed.**
  To close:
  Turn valve handle 90° clockwise (or counterclockwise) until pin is positioned in the pin groove.

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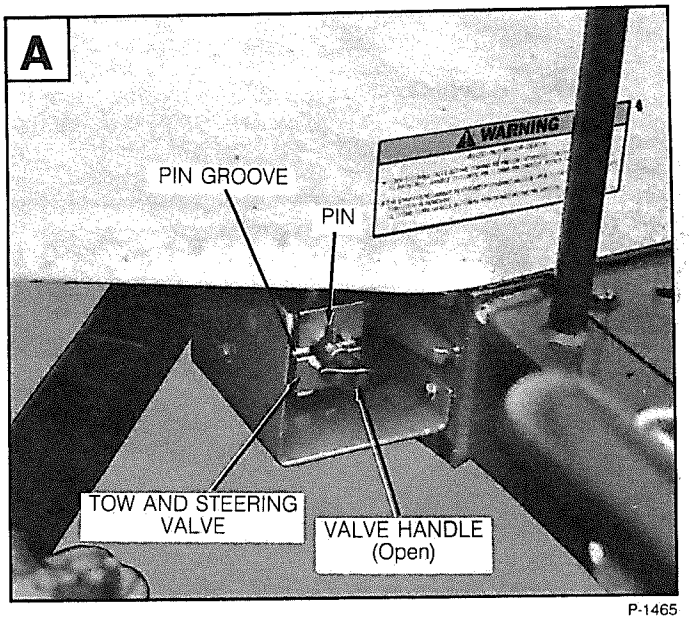

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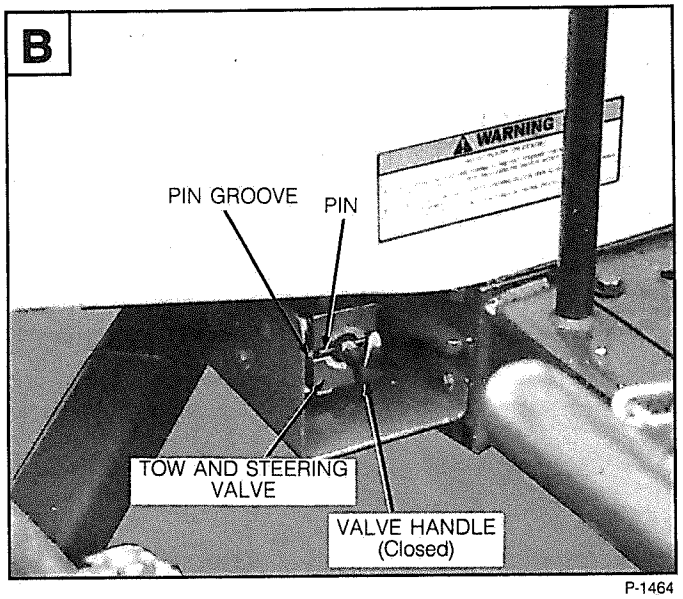

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TOWING THE SPRA-COUPE

Before towing the Spra-Coupe, check that the steering valve is in the tow or "open" position. See **"TOW AND STEERING VALVE OPERATION"** section on Page 1.

⚠ WARNING

AVOID INJURY OR DEATH

BEFORE TOWING

- **Refer to specifications on page 85 for Spra-Coupe shipping weight to assure towing vehicle has adequate capacity.**
- **Empty the spray tank.**
- **Inspect hitch. Repair or replace hitch if damaged or welds are cracked.**
- **Secure latch pins through retaining straps and hitch.**
- **Install hitch pin and fasten safety chain to tow vehicle.**
- **Disconnect axles and install highway tires of adequate capacity if towing above 20 MPH (32 km/h).**
- **Secure booms to transport carrier with tie down straps and chains or pins as equipped.**
- **Close manual boom fold valve if equipped.**
- **Open power steering tow valve, if equipped, per instructions on Spra-Coupe.**
- **Put Spra-Coupe transmission in neutral and release parking brake.**

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⚠ WARNING

AVOID INJURY OR DEATH

Use the Slow Moving Vehicle emblem for warning vehicles approaching from the rear when transporting or towing the Spra-Coupe at 25 mph (40 km/h) or less.

A tow hitch **[B]** is supplied and should be used when towing the Spra-Coupe.

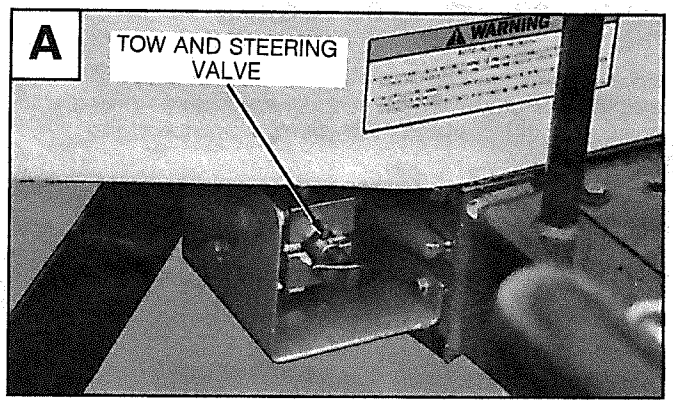
To install hitch:

a). Set the hitch onto the hitch mounts on the lower end of the front wheel fork **[B].**

☛**NOTE: On machines with the wide front assembly, set the hitch onto the hitch mounts on the steering plate [D].**

b). Rotate straps **[C] [D]** under the hitch mounts. Align holes and secure using clevis and spring pin.

c). Install hitch pin and fasten safety chain to the tow vehicle.



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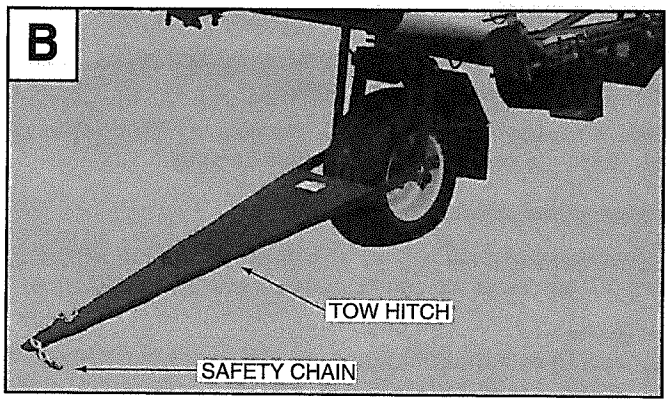

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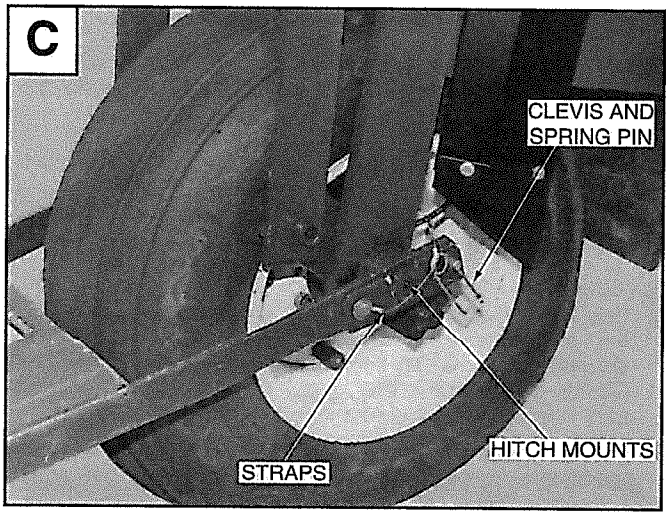

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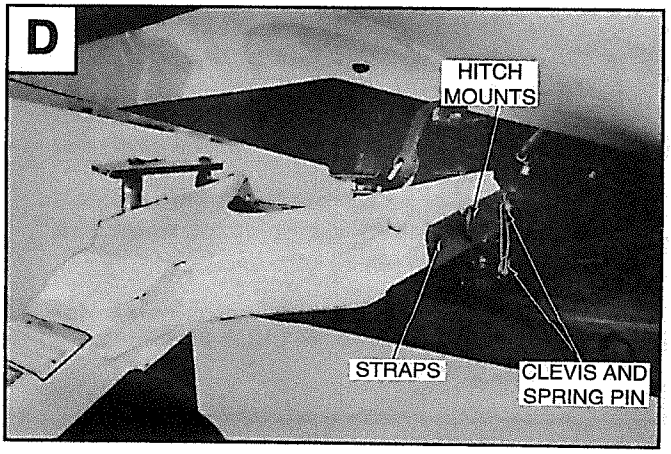

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IMPORTANT

To prevent hitch damage during towing, read and follow the instructions below.

a). The towing vehicle hitching point must be between 14 inches (35.6cm) and 22 inches (55.9cm) above the ground **[A].**

b). The towing vehicle drawbar thickness must not exceed 1 inch (2.54cm) **[B].**

c). Avoid sharp turns when backing up **[C].**

d). Do not tow up or down steep approaches, ditches or embankments **[D].**

e). Only tow on graded or improved roadways **[E].**

The maximum towing speed with axles connected is 20 mph (32 km/h). Axles must be disconnected if towing speed is to exceed 20 mph (32 km/h). See **"DISCONNECTING AXLES FOR TOWING"** section on page 4.

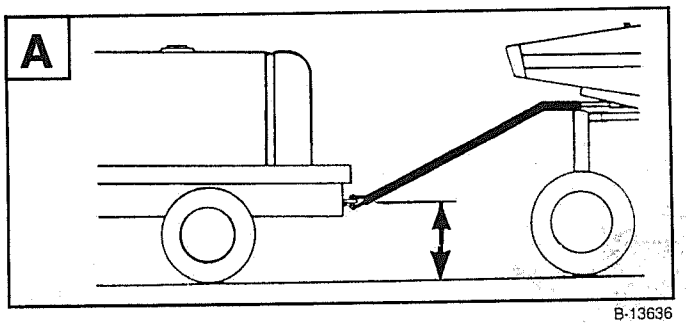
The transmission must be in neutral and hand brake released whenever the Spra-Coupe is being towed.

Always use the flashers when driving the Spra-Coupe on public roads.

⚠ WARNING

AVOID INJURY OR DEATH

The Spra-Coupe cannot be steered if steering valve is open. Close valve when tow hitch is removed. See page 1 for procedure.



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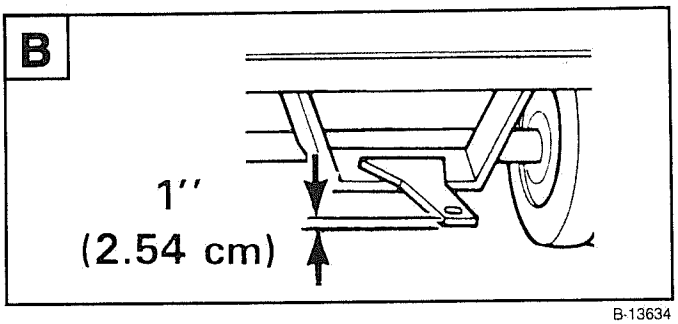

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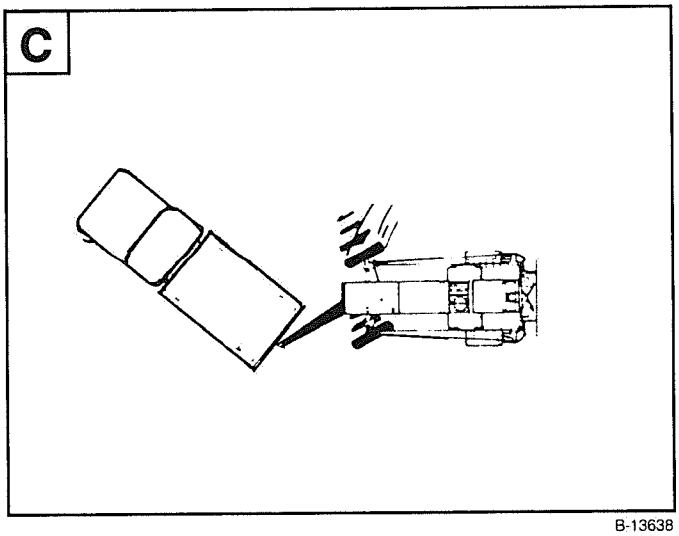

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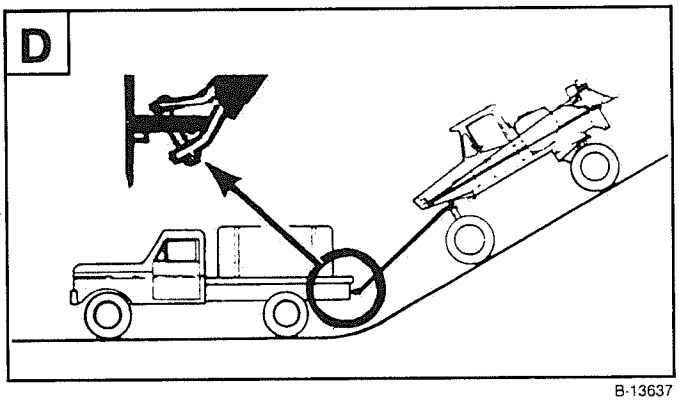

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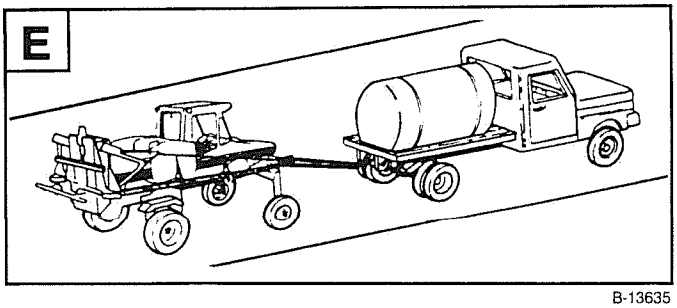

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TOWING THE SPRA-COUPE (Cont'd.)

Disconnecting and Connecting Axles

1. Press axle pin **[A]** in and slide axle off the input shaft on the final drive assembly.
2. With axle pin pressed in, install axle onto the end of the hanger bracket **[B].** Release pin when positioned on the shaft (pin will stay in) then slide the axle onto the hanger bracket until pin snaps into the groove in the hanger.
3. To replace axle onto the input shaft, reverse previous procedure.

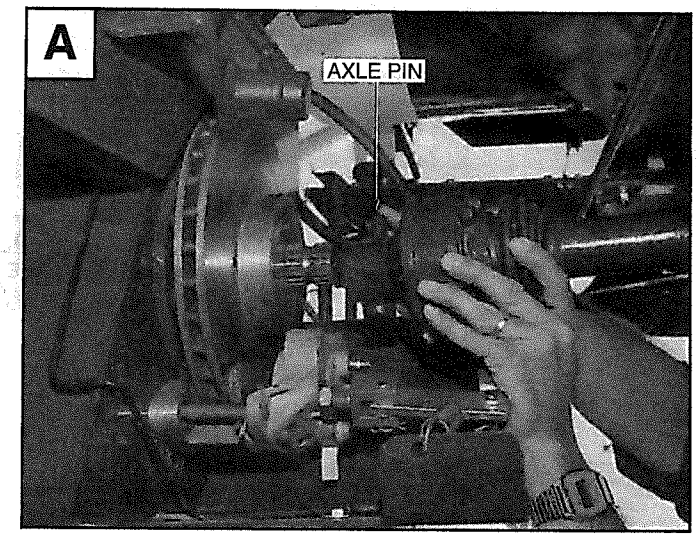
WHEN DONE TOWING THE SPRA-COUPE

1. Stop towing vehicle and Spra-Coupe on level ground.
2. Reinstall axles onto the final drive input shaft and put transmission in first gear. Engage hand brake (page 6).
3. Remove tow hitch.

⚠ WARNING

AVOID INJURY OR DEATH

The Spra-Coupe can roll if axles are disconnected and tow hitch is removed. Before tow hitch is removed, reconnect axles, put transmission in first gear and engage hand brake.



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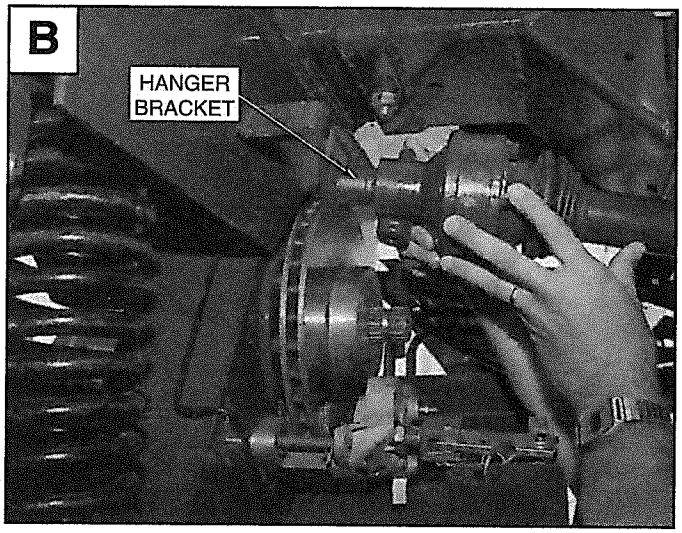
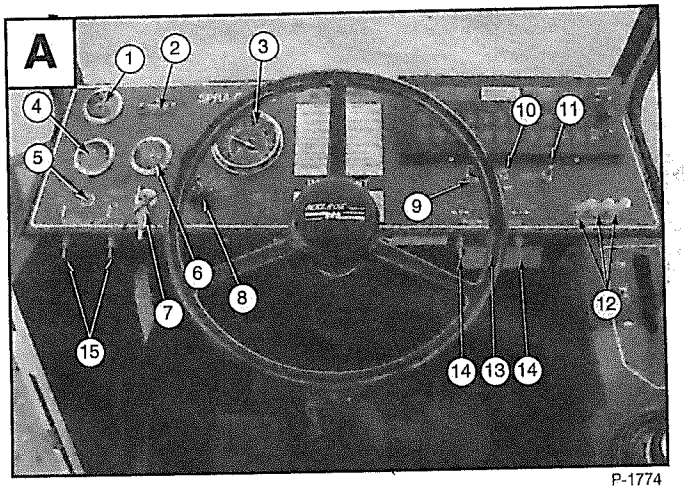


P-1805

LEARNING THE INSTRUMENT PANEL [A]

The instrument panel **[A]** is located directly in front of the operator for easy access and viewing. On the panel are:

1. **ENGINE TEMPERATURE GAUGE** — Shows the engine coolant temperature. If the gauge shows that an overhead condition exists, as indicated by the pointer moving beyond the normal band, stop the engine until the source of trouble can be located and corrected.
2. **HOUR METER** — Records the total operating hours of the Spra-Coupe.
3. **TACHOMETER** — Indicates engine speed in revolutions per minute (RPM).
4. **VOLTMETER** — When the engine is running, the voltmeter indicates the charging system voltage.
5. **ENGINE WARNING LIGHT** — This light will come on to provide a "bulb check" when the key switch is turned on but should go out after the engine is started. The light flickering momentarily or if it comes on continuously while the engine is running, indicates loss of engine oil pressure. Should this occur, stop the engine until the source of trouble can be located and corrected.
6. **FUEL GAUGE** — Shows the amount of fuel in the fuel tank.
7. **KEY SWITCH** — For starting and stopping the engine and preheat operation for carburetion.
8. **LIGHT SWITCH** — Controls function for headlights, flashers and taillight.
9. **PUMP INDICATOR LIGHT** — When on, indicates that the spray pump clutch is engaged.
10. **SPRAY PUMP SWITCH** — Engages and disengages the spray pump electric pump.
11. **PRESSURE ADJUST SWITCH** — Increases and decreases the amount of spraying pressure when pressed and held in the "up" or "down" position.
12. **BOOM SPRAY SELECTOR SWITCHES** — Individual "left-center-right" switches selects the respective boom for spray application.
13. **BOOM HEIGHT SWITCH** — Raises and lowers the boom assembly when pressed and held in the "up" or "down" position.
14. **BOOM FOLD SWITCHES** — Left and right switches individually open or close the respective boom.
15. **BOOM TIP LIFT SWITCHES** — Left and right switches individually raise and lower the end of the boom.



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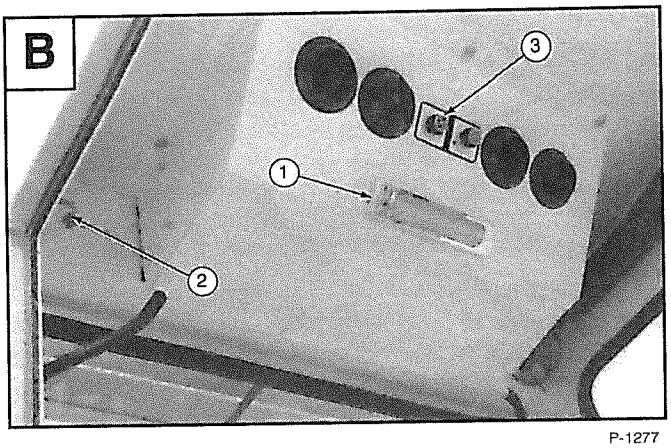


P-1277

OVERHEAD CONTROLS [B]

1. **DOME LIGHT SWITCH** — Turn dome light on and off.
2. **WIPER SWITCH** — Turns the windshield wiper on and off.
3. **OVERHEAD BLOWER SWITCH** — Turns overhead blower on and off with three speed fan control.

LEARNING THE CONTROLS

Steering Wheel

The steering wheel **[A]** (Item 1) is centrally located in the cab in front of the operator.

Before starting and operating the Spra-Coupe, check that the tow and steering valve is in the operating **"closed"** position. **There is no steering control of the front wheel(s) with the steering wheel if the valve is not "closed."** See **"TOW AND STEERING VALVE OPERATION"** section on page 1.

Clutch Pedal

The clutch **[A]** (Item 2) is used to engage or disengage the clutch, thereby connecting or disconnecting the engine from the transmission and driveline to the rear wheels. When the pedal is fully extended, the clutch is engaged, driving the transmission and the rear wheels. **Do not ride the clutch pedal.** This produces a partly disengaged condition that will result in damage to your clutch.

Brake Pedal

The brake pedal **[A]** (Item 3) is located to the right of the clutch pedal. Depressing the pedal will apply the left and right disc brake simultaneously. **Do not "ride the brake " by resting your foot on the pedal when you do not intend to brake.** Riding the brake can overheat the brakes and wear out the brake pads faster.

Hand Brake

The hand brake **[A]** (Item 4) is located on the left side of the floorboard. Pulling the handle to the up position applies left and right brakes simultaneously. Always set the hand brake when leaving the machine unattended. **Release the hand brake before driving the Spra-Coupe.** Failure to do so can overheat the brakes and shorten brake life.

Shift Lever

The shift lever **[A]** (Item 5) is located in the right side console and is used to select one of four transmission forward gears, reverse or neutral. The shift pattern on the shift lever knob (Item 6) shows the correct placement of the shift lever for the corresponding transmission gear selection.

Shifting on the go is possible due to fully synchronized transmission. When shifting, the clutch pedal must be fully depressed.

To shift into reverse:

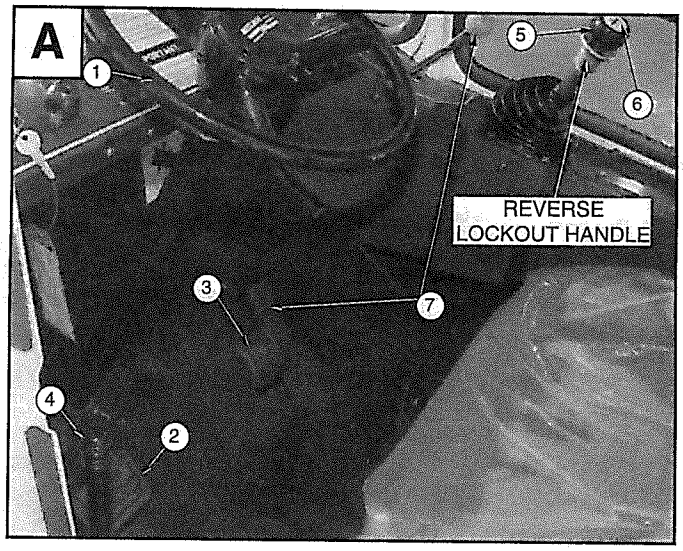
a). Bring the Spra-Coupe to a full stop.
b). With the clutch disengaged, place the shift lever in the neutral position.
c). Lift upward on the reverse lockout handle **[A],** then pull the shift lever fully to the left and into the reverse gear position.

Hand and Foot Throttles

The engine speed is controlled with the foot and/or hand throttle controls **[A]** (Item 7). With the maximum engine speed governed at the carburetor, the throttle controls can be fully operated without harming the engine.

To increase engine speed, depress the foot pedal or move the hand throttle forward. Reverse the procedure to decrease engine speed.

☛NOTE: See "DRIVING THE SPRA-COUPE" section on page 9 for correct use of the hand and foot throttle controls when driving the Spra-Coupe.



P-1773

GETTING ON AND OFF THE SPRA-COUPE

When getting on and off the Spra-Coupe, always use the steps, hand grips, grab handles and footboard provided **[A].**

EMERGENCY EXIT

The rear window in the Spra-Coupe is removable in the event that an emergency exit is required.

To remove the rear window:

a). Grasp and pull the "EXIT" tag **[B]** to remove the extrusion cord.

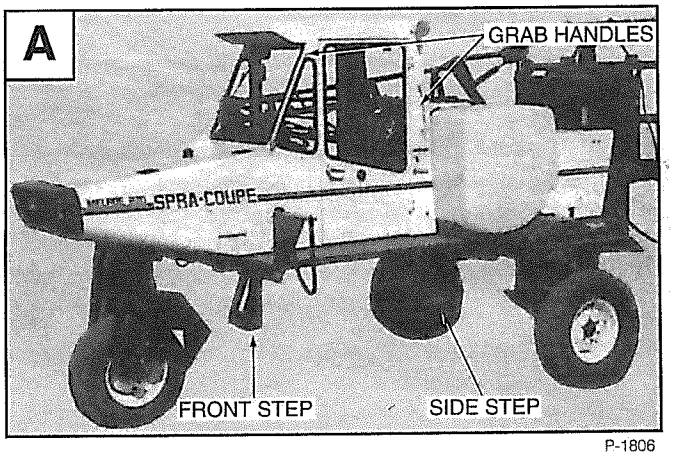
b). Push window outward until clear of window opening.

GETTING READY FOR OPERATION

Adjust the seat for operator comfort using the seat forward/rearward adjust **[C].**

Inspect the seat belt for damage. Check that it fastens and releases properly.

Fasten the seat belt and adjust it so that the buckle is snugly centered between the hips **[C].**



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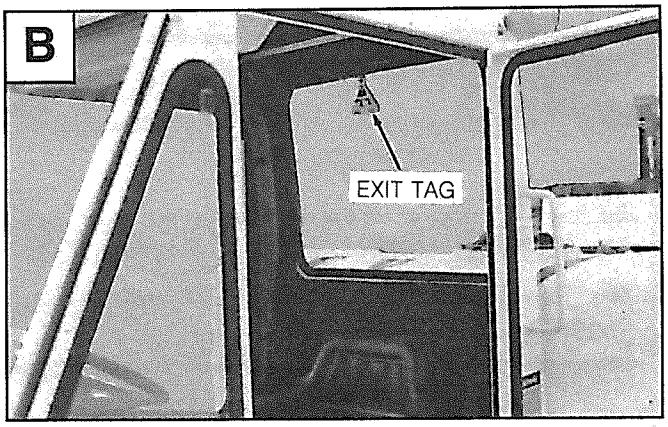

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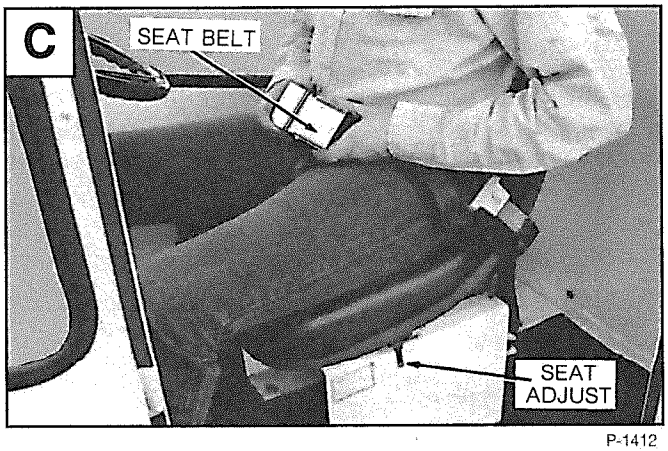


P-1412

STARTING THE ENGINE

⚠ WARNING

When an engine is running in an enclosed area, fresh air must be added to avoid concentration of exhaust fumes. If the engine is stationary, vent the exhaust outside. Exhaust fumes contain odorless, invisible gases which can kill without warning. W-2050-1285

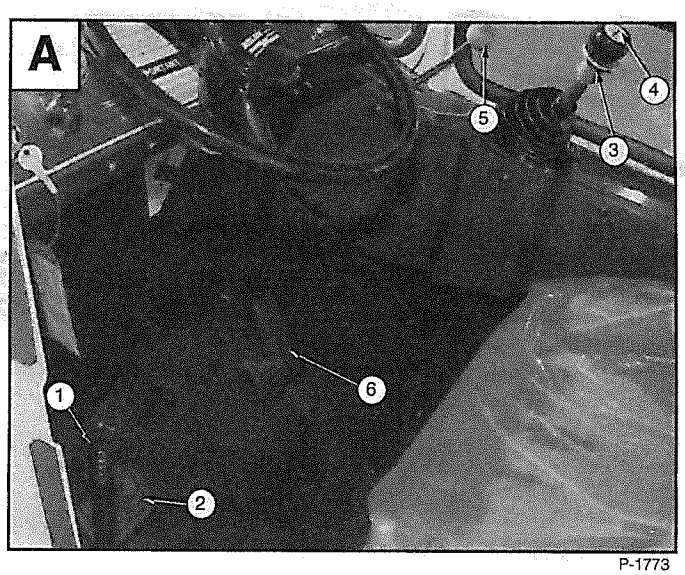
- **Engine can have hot parts and hot exhaust gas. Keep flammable material away.**
- **Do not use machines in atmosphere containing explosive gas.** W-2051-1086

⚠ WARNING

AVOID INJURY OR DEATH

Do not start engine or operate the Spra-Coupe until steering valve has been placed in the "closed" position.

See "TOW AND STEERING VALVE OPERATION" section on page 1 for correct procedure.



P-1773

1. Check oil, coolant and fuel before starting the engine.
2. Apply the hand brake **[A]** (Item 1) before disengaging the clutch and starting the engine.
3. The engine must be started only from the Operator's seat.

To start the engine:

a.) Depress the clutch pedal **[A]** (Item 2) and place the gear shift lever (Item 3) in the "neutral" position (see shift pattern (Item 4) on the instrument panel).

Hold the clutch pedal to the floor while you are starting the engine, so the starter only has to turn the engine.

b). Place the hand throttle **[A]** (Item 5) in the "idle" position.

c). Insert key into the ignition switch.

When starting a cold engine — Depress and release the foot throttle [A] (Item 6) twice to get fuel into the system and to activate the automatic choke.

When starting a warm engine — Simply straight away.

In cold weather starting (0°F (18°C) and below) — Depress and release the foot throttle **[A]** (Item 6) three or four times to get fuel into the system and to activate the automatic choke. Then turn the ignition switch to "ON" position for 30 to 45 seconds (to warm the air in the intake with the intake manifold heater).

d). Start engine by turning the ignition switch clockwise to the "Start" position to crank the engine. Release the key when the engine starts.

After starting a cold engine, rattling noises may be heard from the engine caused by the hydraulic tappets because the oil pressure has to build up first. This is normal and no cause for alarm.

e). Allow engine to warm before working engine or increasing engine speed to full throttle.

STARTING THE ENGINE (Cont'd.)

Engine Warning Light

The engine warning light **[A]** (Item 2) comes on when the starter key is turned on and should go out when engine is started.

If engine warning light comes on or flickers when engine is running:

a). Stop the engine immediately because in this case the engine lubrication may have ceased.

b). Check oil level (see page 33). If level is in order, consult your Spra-Coupe dealer.

An occasional flickering of the warning lamp at idling speed when engine is warm is quite harmless, provided that the light goes out again when engine speed is increased.

Engine Temperature Gauge

If the temperature gauge [A] (Item 1) shows that an overheat condition exists, as indicated by the pointer moving beyond the normal band, stop the engine immediately and check:

a). That there is sufficient coolant in system, check system for leaks.

b). That fan is working.

c). That thermoswitch is working.

d). That fan belt is in order.

e). That coolant pump is working.

If fault cannot be rectified, consult your Spra-Coupe dealer.

DRIVING THE SPRA-COUPE

No riders are allowed in the operator cab or on the machine.

a). Start the engine. Refer to the procedures in **"STARTING THE ENGINE"** section on pages 8 and 9.

b). Release the hand brake **[B]** (Item 1).

c). Shift into low gear using the gear shift lever **[B]** (Item 3).

d). Release the clutch pedal while accelerating the engine using the foot throttle control **[B]** (Item 5). To obtain a faster speed, shift the transmission to the next higher speed using the shift lever (Item 3). When shifting, the clutch pedal must be fully depressed.

Always use the foot throttle to start the machine in motion and when shifting gears. Use of the hand throttle **[B]** (Item 4) is to be limited to longer straight stretches in the field after machine is in motion and at full throttle in the operating gear desired. As you approach the end of the field, depress the foot pedal and place the hand throttle in the "idle" position. Use the foot throttle to control the speed of the Spra-Coupe through the turn.

STOPPING THE ENGINE

Allow the engine to idle for a few minutes to cool down; then switch the ignition off.

⚠ WARNING

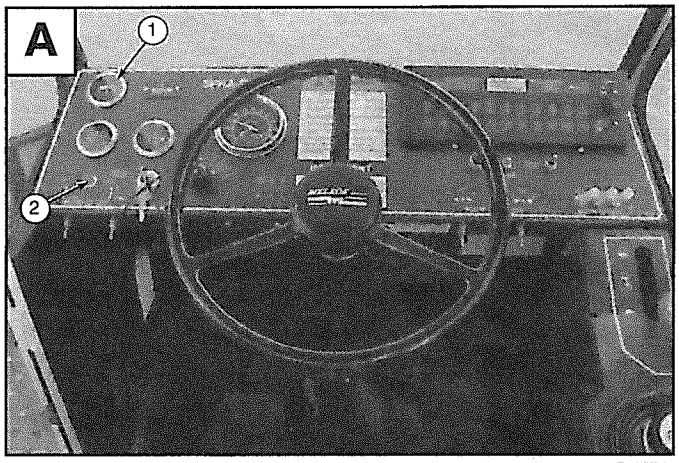
AVOID INJURY OR DEATH

- **Keep bystanders away from Spra-Coupe.**
- **Avoid driving over steep hills and ditches.**
- **Drive slowly when turning or when driving over rough terrain.**

⚠ WARNING

AVOID INJURY OR DEATH

Disengage the clutch and place the gear shift lever in neutral before starting Spra-Coupe engine.



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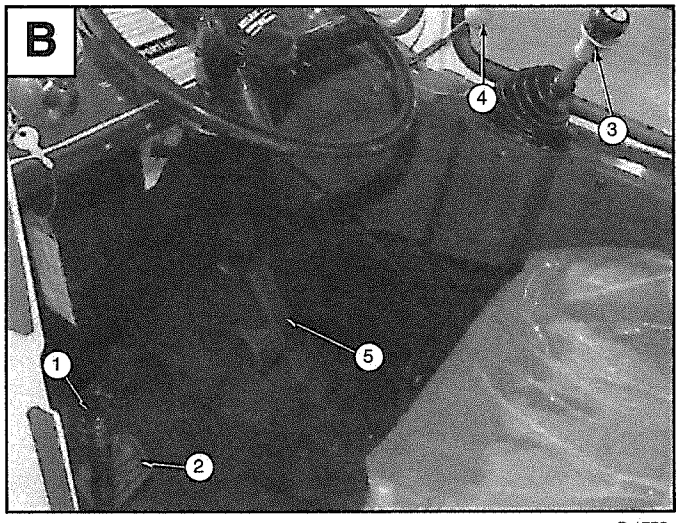


P-1773

⚠ WARNING

AVOID INJURY OR DEATH

Area must be clear of personnel and objects before activating the boom controls. Raise boom above fenders and transport carriers before folding.

Opening the Booms

1. Release the tie down chains to free the booms from the boom transport carriers **[A].**

2. To open the booms, start the engine to operate the hydraulic pump.

3. Use the boom tip lift switches or boom height control switch **[D]** to assist lifting of boom out of the boom transport carriers.

4. Hold the left boom control switch **[D]** in the "out" position (to the left.) Hold the right boom control switch in the "out" position (to the right). Release the control switch when booms are fully extended.

5. Unhook the outer boom strap **[A]** and swing outer boom **[B]** forward until it engages at the spring latch at the hinge point **[C].**

Boom Height Control

The distance between the spray tips and the ground can be varied by raising or lowering the boom using the boom height control switch **[D]** on the instrument panel.

To operate the boom height control, the engine must be running to operate the hydraulic pump.

To raise the boom, push and hold the height control switch in the "up " position. Release switch to stop.

To lower the boom, push and hold the height control switch in the "down" position. Release switch to stop.

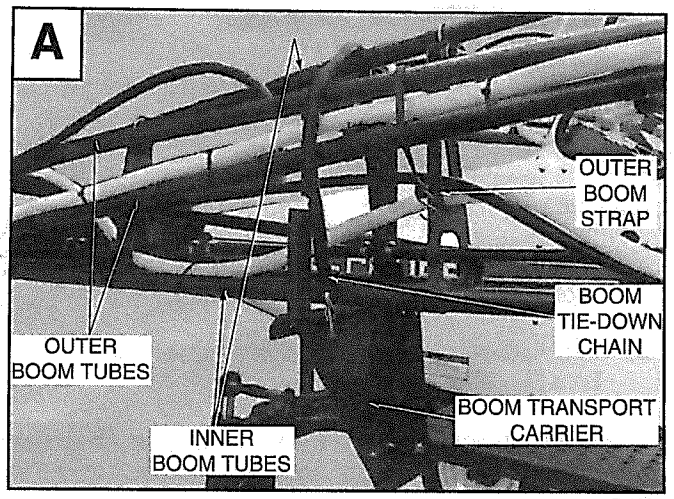
The boom height control switch will adjust the boom approximately 35 in. (88.9 cm). The minimum to maximum height that the boom can obtain is determined by the mounting position of the lift cable and roller brackets. For readjustment procedures, see **"BOOM HEIGHT ADJUSTMENT"** section on page 25.

Boom Tip Lift

The end (or tip) of the booms can be lifted approximately 48" (121.93cm) from inside the cab to avoid obstacles in the field or to assist in placement of the booms onto the transport carriers.

To operate the boom tip lifts, the engine must be running to operate the hydraulic pump.

To raise the end of the left or right boom, hold the respective tip lift switch **[D]** in the "up" position. Release switch to stop. To lower, hold switch in the "down" position. Release switch to stop.



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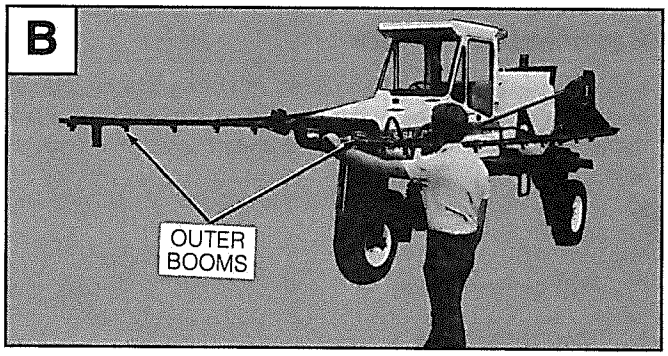

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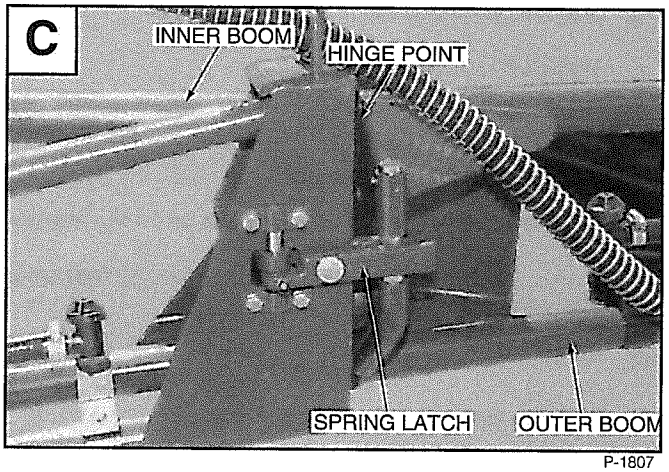

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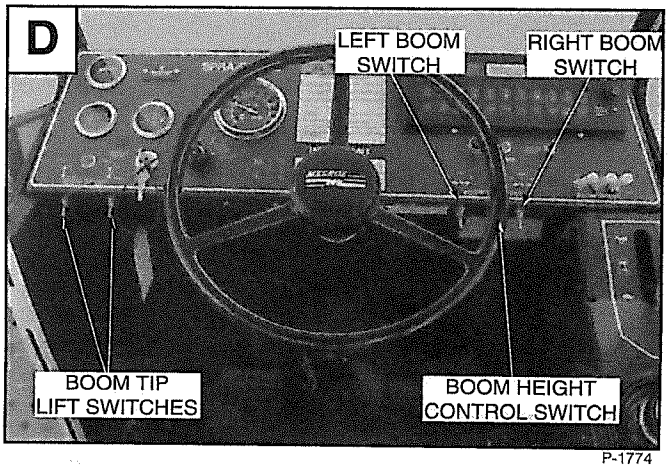


P-1774

OPERATING THE BOOMS (Cont'd.)

Folding the Booms

1. Pull on the end of outer boom to disengage from the spring latch **[C]** at the hinge point.

   Fold the boom approximately half way then pivot the boom return stop **[B]** upward and complete the fold.

2. Before folding the booms, assure that the height of the boom is sufficient to clear the rear fenders and the boom transport carrier. Adjust the boom height (if required) using the boom height control switch until the center tube of the boom main frame aligns with the locator strips on the boom support **[A].**

3. To operate the boom fold, start the engine to operate the hydraulic pump.

IMPORTANT

Reduce engine RPM to decrease speed of fold as booms approach the cab. Failure to do so could cause damage to the boom or machine.

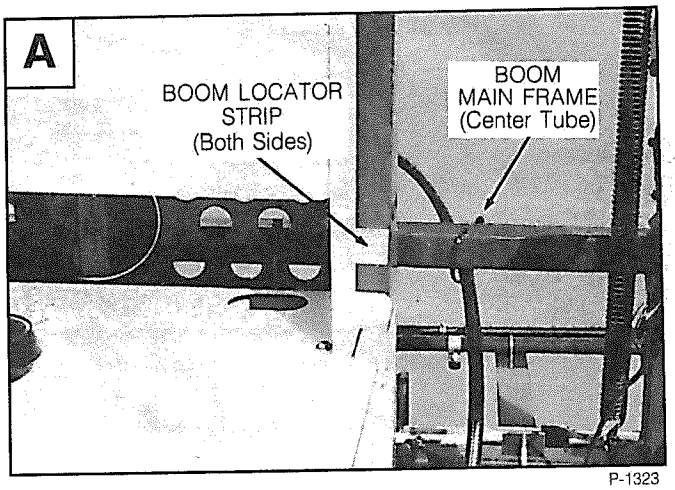
4. Hold the respective boom fold control switch **[D]** in the "in" position until boom is positioned over the boom transport carrier then release switch.

5. Lower the boom onto the boom transport carriers using the boom height switch **[D].**

6. Secure inner and outer booms to the boom transport carriers using the boom tie-down chains as shown [A] (page 10).

☛NOTE: Be certain the boom tie-down chain is routed to secure the outer and inner boom sections to the boom transport carrier as shown in Figure [A] (page 10) when securing the booms for transport.

☛NOTE: The outer boom strap [A] (page 10) is to be used for field use when spraying with the outer boom folded is desired. It should NOT be used to secure the outer boom for transport.



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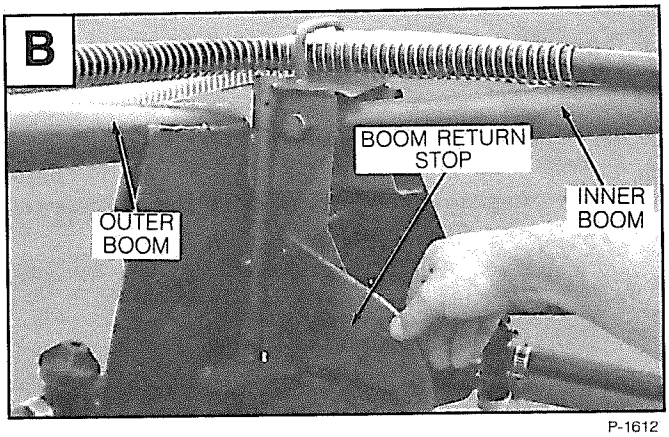

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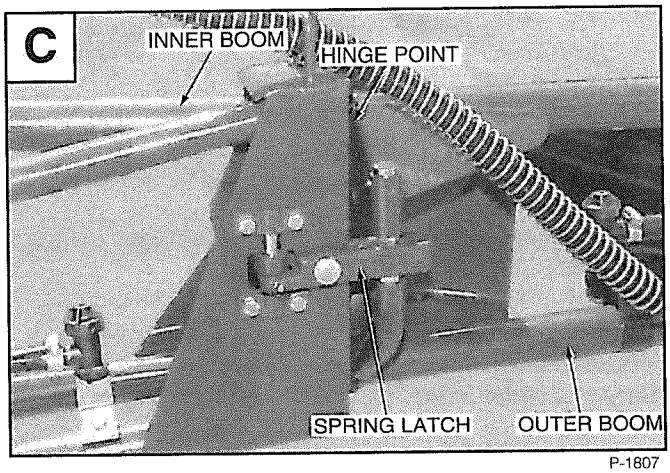

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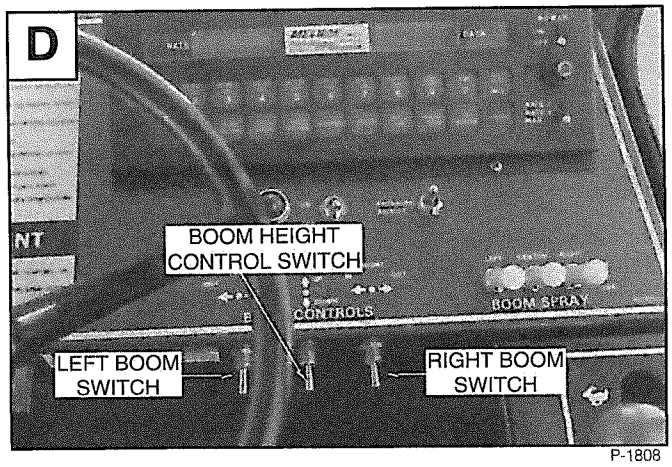


P-1808

OPERATING THE SPRAY SYSTEM

Spray Pump

The spray pump **[A]** is not self priming. Before engaging the pump clutch, the liquid level in the tank should be higher than the pump to assure proper priming.

If the pump is run dry for any short period of time, the internal seal may overheat. Turn pump off immediately and let seal cool. The seal may fail from overheating in a very short time or from thermal shock caused from the cold liquid coming in contact with the hot seal after being run dry.

IMPORTANT

Do not run pump dry. Excessive heat will damage internal seals.

When pump is turned "ON," water should start circulating immediately. This indicates the pump is primed. If pump does not prime, stop pump immediately. Refer to "TROUBLESHOOTING" section on page 75 for possible causes.

Before operating the spray pump:

1. Add clean filtered water to the tank (to a level higher than the spray pump).
2. Open the main line valve **[B].**
3. Open agitation valve **[B].**
4. Place the boom selector switches **[C]** (Item 1) in the "off" position.
5. Start engine.
6. Momentarily press and hold the pressure adjust switch **[C]** (Item 2) upward to assure that the pressure control valve **[A]** is open.
7. With the engine idling, place the pump switch **[C]** (Item 3) in the "on" position to engage the pump clutch.

   If pump is primed, there will be pressure indicated on the pressure gauge **[D].** If pump is not primed, stop pump immediately. Refer to **"TROUBLESHOOTING"** section for possible causes.
8. With water circulating, the pump is ready for operation.

Pump Switch

☛NOTE: See "SPRAY PUMP" section above before placing the pump switch in the "on" position with the engine running.

The pump switch **[C]** (Item 3) is located in the instrument panel to the right of the operator. To activate the pump clutch, turn the ignition switch to the "accessory" or "on" position. The pump clutch can then be engaged by placing the pump switch in the "on" position. The pump indicator light (Item 4) will glow when the pump clutch has been activated.

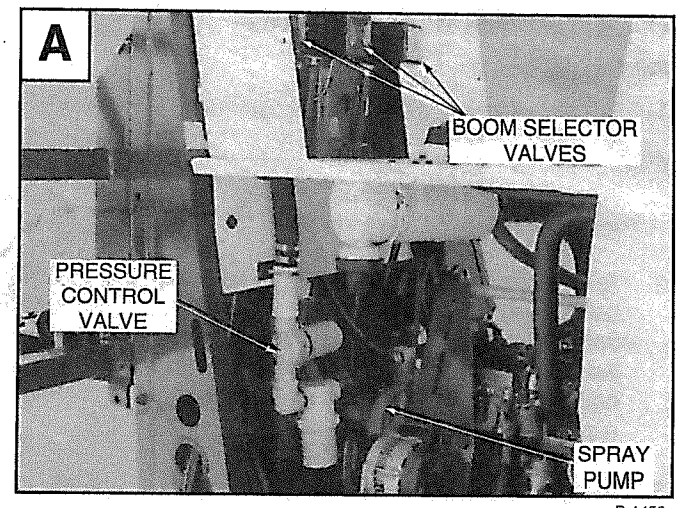
Spray Pressure Control

The spray pressure adjust switch **[C]** (Item 2) is located in the instrument panel to the right of the operator.

To adjust the spraying pressure, push and hold the adjust switch (upward to increase or downward to decrease spray pressure) until desired pressure is indicated on the pressure gauge **[D].**

Boom Spray Selection

The boom spray selector switches **[C]** (Item 1) are located in the instrument panel to the right of the operator. With the selector switches, any manifold working combination is obtainable through the selector valves **[A]**. The ignition switch must be in the "accessory" or "on" position for the selector valves to operate.



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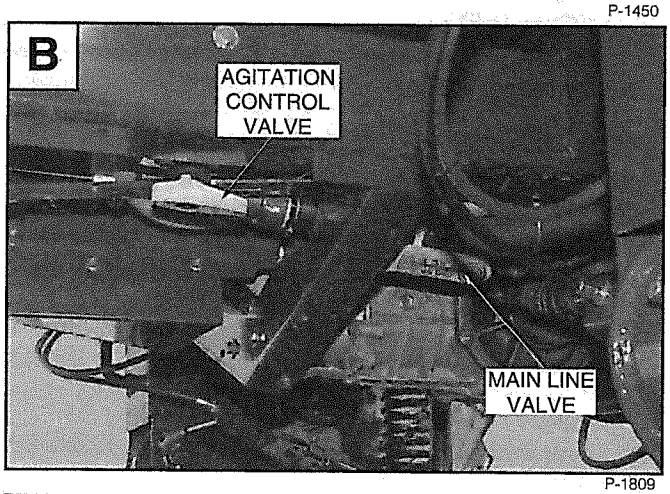

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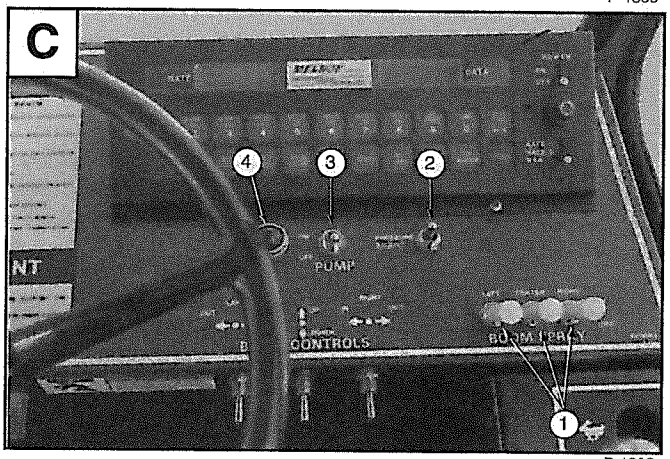

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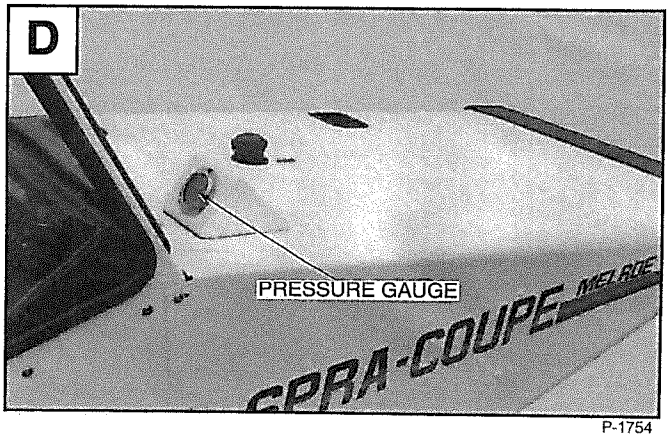


P-1754

OPERATING THE SPRAY SYSTEM (Cont'd.)

Filling The Tank

The tank can be filled through the opening on the top of the tank or through the bottom tank fill system.

To fill through the bottom tank fill system:

1. Close the boom selector valves. (See **"BOOM SPRAY SELECTION"** section on page 12).
2. Check that the main line valve **[A]** is "open."
3. Check that the quick disconnect valve **[B]** (Item 1) is "closed."
4. Remove cap **[B]** (Item 2) on the quick disconnect and complete the hose connection from your external pump and nurse tank system.
5. With your fill system ready and operating, open the valve at the quick disconnect **[B]** (Item 1).
6. When tank is filled, close quick disconnect valve **[B]** (Item 1) and shut down the external fill system.
7. Disconnect fill hose at the quick disconnect and replace cap **[B]** (Item 2).

Tank Agitation

The agitation of your chemical mixture can be regulated by:

a). Changing the orifice in the agitator jet **[C]** (Inset A).

b). Using the agitation control valve **[A]** to throttle the bypass to obtain the desired maximum spray pressure, minimum spray pressure and/or tank agitation.

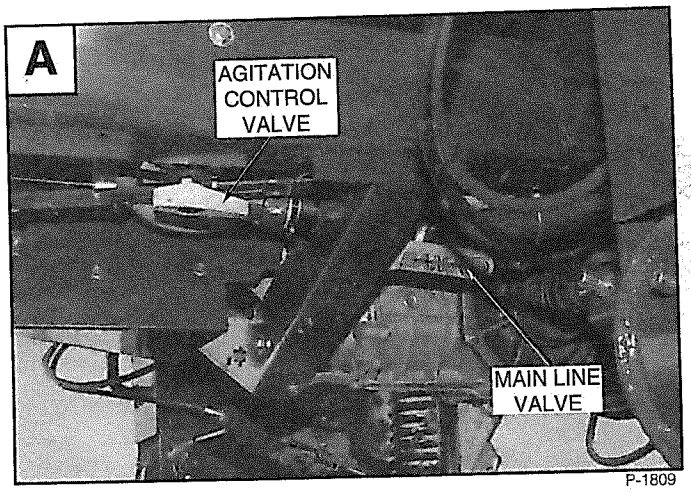
Minimum pressure is affected by the position of the agitation control valve **[A].**

If the agitation control valve is closed or partially open, the minimum pressure obtainable is increased. Installation of an agitation orifice in the agitator jet **[C]** will increase the maximum and minimum pressures obtainable with the agitation control valve open.

The Spra-Coupe is shipped from the factory with no orifice installed in the jet agitator. Four orifices are supplied in a bag of parts inside the Spra-Coupe. The table below identifies the amount of agitation each orifice supplies. (The natural orifice supplies the greatest amount of agitation.)

SPRA-COUPE AGITATION	P.S.I.	G.P.M. INLET	G.P.M. OUTLET
Natural - 1/4" orifice	30	6.5	19.5
Blue - 3/16" orifice	30	5.3	15.4
Red - 5/32" orifice	30	4.1	13.2
Yellow - 1/8" orifice	30	2.9	9.5
From the natural to yellow orifice, there is 49% decrease.			

To change an orifice, remove agitator assembly from inside the tank. Remove orifice **[C]** (Inset A) from agitator and replace with desired orifice. Be sure orifice is pressed into the agitator. Reinstall the agitator into the bottom of the tank and tighten.



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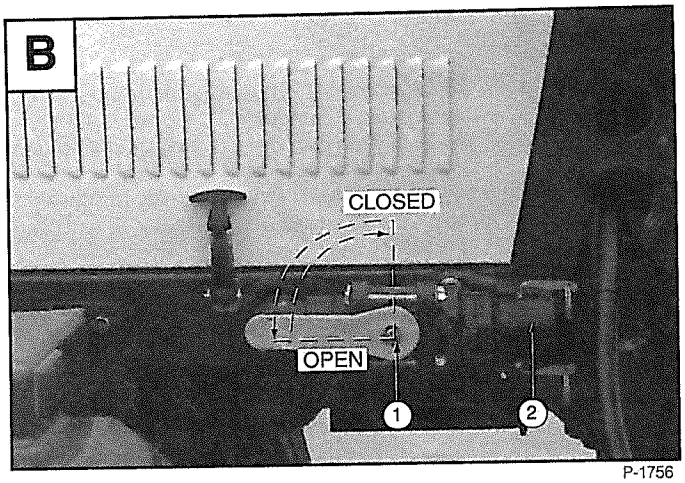

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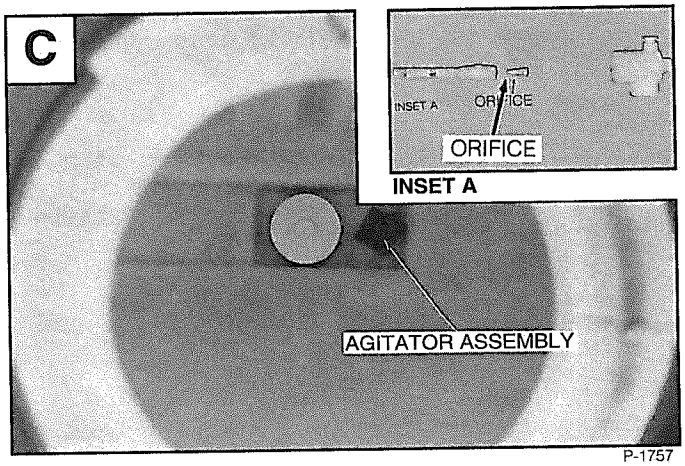

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PREPARING THE SPRA-COUPE FOR SPRAY APPLICATION

Several factors must be determined in preparing the Spra-Coupe for spray application.

a). The amount of chemical to be applied per acre. (Refer to the label on the container of the chemical to be applied for the manufacturer's recommended rate.)
b). The recommended application rate (GPA). (Refer to the label on the container of the chemical to be applied for the manufacturer's recommended rate.)
c). The speed of travel.
d). The spraying pressure.
e). The size of the nozzle tip.
f). Boom height.

Using The Application Chart

THE APPLICATION CHART SHOULD BE USED ONLY AS A GUIDE. Varying spraying conditions will affect actual application. The amount of solution applied per acre depends upon forward speed, pump pressure, size and condition of nozzles and nozzle spacing. A change of any of these will change the application rate.

Use the following procedure when referring to the application chart for initial speed, nozzle size and spraying pressure selections.

a). GEAR SELECTION — Estimate the maximum safe speed of travel to operate in the field to be sprayed. Refer to the **"SPEED CHART"** section on the following page and select the gear required to obtain the desired spraying speed.

Example: Using the standard rear 7.50 x 16 "General" Mud Grip tire and operating in 2nd gear at full throttle (with the tank ½ full of water) will have a speed of approximately 9.2 mph.

b). APPLICATION RATE — Refer to the label on the container for the chemical to be applied to acquire the manufacturer's recommended rate of application.

Example: 8.5 GPA

c). LOCATE APPLICATION RATE ON CHART — Refer to the application chart (pages 18-21) and locate 8.5 gal/acre (or the closest rate to it) within the speed column closest to the above 9.2 mph speed selection for different nozzle tips and pressures. For this example, the 9 mph column is used.

Example:
- 8.6 GPA w/80015 tip @ 120 psi.
- 8.7 GPA w/8002 tip @ 70 psi.
- 8.4 GPA w/8003 tip @ 30 psi.

Select the preferred nozzle tip and pressure combination to obtain the desired application rate. (The spray pressure will require a slight adjustment to obtain exact application rates.)

If the above pressure selections do not meet the manufacturer's recommendations or your desired requirements, select another speed higher or lower than the initial speed considered and repeat the above procedures.

d). With initial speed, nozzle and approximate spray pressure determined from the chart, use one of the calibration procedures on page 16 to "fine tune" calibrate the Spra-Coupe for your field conditions.

Spraying Solutions Other Than Water

Since all the tabulations are based on spraying water, which weighs 8.34 lbs. per USA gallon, conversion factors must be used when spraying solutions which are heavier or lighter than water. To determine the proper size nozzle for the solution to be sprayed, first convert the desired GPM or GPA of solution to a water rate using the conversion factors. Then use the new converted GPM or GPA rate to select the proper size nozzle.

Example:
a). The chemical manufacturer's recommended rate of application is 8.5 GPA.
b). A solution of 28% nitrogen will have a specific gravity of 1.28 and a conversion factor of 1.12. The converted GPA is therefore 9.52.
8.5 GPA x 1.12 = 9.52 GPA.
c). Locate the new (converted) GPA (9.52 or closest rate to it) in the desired speed column on the application chart for the nozzle spacing of your boom. Referring to the application chart (page 18), at 9 mph, with the 8003 nozzle tip and 40 psi, the Spra-Coupe will apply 9.9 GPA of water or 8.5 GPA of 28% nitrogen solution.

WEIGHT OF SOLUTION		SPECIFIC GRAVITY	CONVERSION FACTORS
lbs./gallon	kilograms/liter		
7.0	0.84	.84	.92
8.0	0.96	.96	.98
8.34 - WATER	1.00	1.00	1.00
9.0	1.08	1.08	1.04
10.0	1.20	1.20	1.09
10.65 - 28% nitrogen	1.28	1.28	1.12
11.0	1.32	1.32	1.14
12.0	1.44	1.44	1.20
14.0	1.68	1.68	1.29

Speed Calibration

It is recommended to use the actual speed of the Spra-Coupe in the field to be sprayed to obtain more accurate results when calibrating the rate of application.

Calculate the Spra-Coupe speed in the field to be sprayed as follows:

1. Fill the spray tank ½ full of clean, well filtered water.
2. Mark off the distance listed below for the gear you intend to use for spraying.

   1st Gear 200 ft. or 60 m
   2nd Gear 400 ft. or 120 m
   3rd Gear 700 ft. or 200 m
   4th Gear 1200 ft. or 365 m

3. Drive the Spra-Coupe through the previously measured distance at full throttle (in the gear selected) and record the time. Use sufficient take off distance when approaching the start line to permit the engine to reach maximum governed RPM.
4. Calculate the Spra-Coupe speed as follows:

1st Gear

$$MPH = \frac{136.36}{\text{seconds to drive 200 ft.}}$$

$$km/hr = \frac{134.19}{\text{seconds to drive 60 m}}$$

2nd Gear

$$MPH = \frac{272.73}{\text{seconds to drive 400 ft.}}$$

$$km/hr = \frac{268.37}{\text{seconds to drive 120 m}}$$

3rd Gear

$$MPH = \frac{477.27}{\text{seconds to drive 700 ft.}}$$

$$km/hr = \frac{447.29}{\text{seconds to drive 200 m}}$$

4th Gear

$$MPH = \frac{818.18}{\text{seconds to drive 1200 ft.}}$$

$$km/hr = \frac{816.20}{\text{seconds to drive 365 m}}$$

Speed Charts

The speeds listed in the following charts were found by operating the Spra-Coupes on a hard road surface with the spray tank ½ full of water at full throttle (maximum governed RPM). USE THE CHARTS BELOW AS A GUIDE ONLY.

Model 220

TIRE SIZE	GEAR	SPEED
7.50 x 16 "GENERAL" MUD GRIP	1ST	5.0 MPH (8.0 km/hr)
	2ND	9.2 MPH (14.8 km/hr)
	3RD	14.6 MPH (23.5 km/hr)
	4TH	21.5 MPH (34.6 km/hr)
31 x 13.5-15 LT RIB	1ST	5.2 MPH (8.4 km/hr)
	2ND	9.6 MPH (15.4 km/hr)
	3RD	14.8 MPH (23.8 km/hr)
	4TH	22.0 MPH (35.4 km/hr)
29 x 12.50-15 EXTRA TRACTION FLOTATION	1ST	4.9 MPH (7.8 km/hr)
	2ND	8.9 MPH (14.3 km/hr)
	3RD	14.0 MPH (22.5 km/hr)
	4TH	20.4 MPH (32.8 km/hr)
29 x 12.50-15 BAR LUG	1ST	4.5 MPH (7.2 km/hr)
	2ND	8.4 MPH (13.4 km/hr)
	3RD	12.8 MPH (20.5 km/hr)
	4TH	19.1 MPH (30.6 km/hr)

Spray Calibrations

The application chart should be used only as a guide. Varying spraying conditions will affect actual application considerably.

For best results, check calibration every 500 acres.

Quart (Liter) Calibration

1. Calculate and record the Spra-Coupe speed in the field to be sprayed. (See page 15.)
2. Select and install the nozzle tip (and screens) required to obtain the desired application rate. See **"USING THE APPLICATION CHART"** section on page 14.
3. Start engine and park the Spra-Coupe on level ground. Engage hand brake and put the transmission in neutral. With engine idling, engage the spray pump. (See **"SPRAY PUMP"** section on page 12 for safe pump operating procedures.)
4. With pump primed, increase engine speed to full throttle.
5. Adjust spraying pressure to that required to obtain the desired application rate as indicated on the application chart.
6. Record the time required to catch one quart (or one liter) of water from one nozzle. Repeat for several nozzles and average the time.
7. Switch pump "OFF"" and stop engine.
8. Using the following formula, calculate gallons (or liters) per minute.

$$GPM = \frac{15}{\text{Average nozzle output (Seconds)}}$$

$$LPM = \frac{60}{\text{Average nozzle output (Seconds)}}$$

9. Use the following formula, calculate the application rate (gallons per acre-GPA or liters per hectare-LPH).

For 30" (76.2cm) Nozzle Spacing:

$$GPA = \frac{198 \times GPM}{MPH} \quad \text{OR LPH} = \frac{787.4 \times LPM}{km/hr}$$

For 20" (50.8cm) Nozzle Spacing:

$$GPA = \frac{297 \times GPM}{MPH} \quad \text{OR LPH} = \frac{1181.1 \times LPM}{km/hr}$$

10. If nozzle output is higher or lower than that recommended by the chemical manufacturer, readjust spray pressure respectively and repeat steps 3 thru 9.

Ounce Calibration

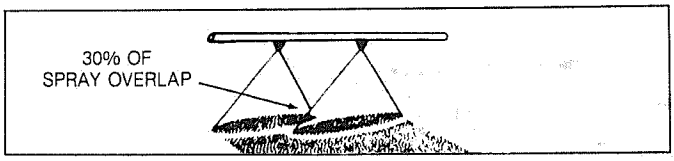
1. Select and install the nozzle tip (and screens) required to obtain the desired application rate. See **"USING THE APPLICATION CHART"** section on page 14.
2. Fill the spray tank 1/2 full of clean, well filtered water.
3. Measure the distance listed below (for the nozzle spacing on your boom) in the field to be sprayed.

   20" (50.8cm) Nozzle Spacing- 204 ft. (62.2 m)
   30" (76.2cm) Nozzle Spacing- 136 ft. (41.5 m)

4. Drive the Spra-Coupe through the previously measured distance at full throttle (in the gear selected) and record the time. Use sufficient take off distance when approaching the start line to permit the engine to reach maximum governed RPM.
5. Park the Spra-Coupe on level ground. Engage hand brake and put the transmission in neutral. With engine idling, engage the spray pump. (See **"SPRAY PUMP"** section on page 12 for safe pump operating procedures.)
6. With pump primed, increase engine to full throttle.
7. Adjust spraying pressure to that required to obtain the desired application rate as indicated on the application chart.
8. Catch the spray from one nozzle for the time noted in step 4 in container marked in oz. The nozzle output in oz. = gal./A actually applied.
9. Repeat for each nozzle to assure uniform nozzle output.
10. Switch pump "OFF" and stop engine.
11. If nozzle output in oz. (gal./A) is higher or lower than that recommended by the chemical manufacturer, readjust spray pressure respectively and repeat steps 2 thru 10.

Boom Spraying Height

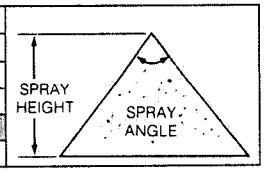
The spraying height (the distance from the tip of the nozzle to the top of the crop or surface to be sprayed) should be adjusted to overlap approximately 30% of each edge of the spray pattern.



The chart below outlines the spray height dimension required to obtain the correct overlap for 20" (50.8cm) and 30" (76.2cm) nozzle spacing when using one of the more common tips (spraying angles) listed below. (The Spra-Coupe is equipped with the 80 degree spray tip as standard.)

SUGGESTED MINIMUM SPRAY HEIGHTS

Spray Angle	SPRAY HEIGHT	
	20" Spacing	30"Spacing
65°	22" to 24"	33" to 35"
73°	20" to 22"	29" to 31"
80°	17" to 19"	26" to 28"
110°	10" to 12"	14" to 18"



*Spray angles apply to flat spray tips spraying at rated pressure of 40 psi.

APPLICATION CHART

TIP NO.	LIQUID PRESSURE PSI	CAPACITY 1 NOZZLE GPM	GALLONS PER ACRE – 20" SPACING																				
			4 MPH	5 MPH	6 MPH	7 MPH	8 MPH	9 MPH	10 MPH	11 MPH	12 MPH	13 MPH	14 MPH	15 MPH	16 MPH	17 MPH	18 MPH	19 MPH	20 MPH	21 MPH	22 MPH	23 MPH	24 MPH
8001 100 MESH TIP SCREEN	20	0.07	5.2	4.2	3.5	3.0	2.6	2.3	2.1	1.9	1.7	1.6	1.5	1.4	1.3	1.2	1.2	1.1	1.0	1.0	0.9	0.9	0.9
	30	0.09	6.4	5.1	4.3	3.6	3.2	2.8	2.6	2.3	2.1	2.0	1.8	1.7	1.6	1.5	1.4	1.3	1.3	1.2	1.2	1.1	1.1
	40	0.10	7.4	5.9	4.9	4.2	3.7	3.3	2.9	2.7	2.5	2.3	2.1	2.0	1.8	1.7	1.6	1.5	1.5	1.4	1.3	1.3	1.2
	50	0.11	8.2	6.6	5.5	4.7	4.1	3.7	3.3	3.0	2.7	2.5	2.3	2.2	2.1	1.9	1.8	1.7	1.6	1.6	1.5	1.4	1.4
	60	0.12	9.0	7.2	6.0	5.1	4.5	4.0	3.6	3.3	3.0	2.8	2.6	2.4	2.2	2.1	2.0	1.9	1.8	1.7	1.6	1.6	1.5
	70	0.13	9.7	7.8	6.5	5.6	4.9	4.3	3.9	3.5	3.2	3.0	2.8	2.6	2.4	2.3	2.2	2.0	1.9	1.9	1.8	1.7	1.6
	80	0.14	10.4	8.3	6.9	5.9	5.2	4.6	4.2	3.8	3.5	3.2	3.0	2.8	2.6	2.4	2.3	2.2	2.1	2.0	1.9	1.8	1.7
	90	0.15	11.0	8.8	7.3	6.3	5.5	4.9	4.4	4.0	3.7	3.4	3.1	2.9	2.8	2.6	2.4	2.3	2.2	2.1	2.0	1.9	1.8
	100	0.16	11.6	9.3	7.7	6.6	5.8	5.2	4.6	4.2	3.9	3.6	3.3	3.1	2.9	2.7	2.6	2.4	2.3	2.2	2.1	2.0	1.9
	110	0.16	12.2	9.7	8.1	6.9	6.1	5.4	4.9	4.4	4.1	3.7	3.5	3.2	3.0	2.9	2.7	2.6	2.4	2.3	2.2	2.1	2.0
	120	0.17	12.7	10.2	8.5	7.3	6.3	5.6	5.1	4.6	4.2	3.9	3.6	3.4	3.2	3.0	2.8	2.7	2.5	2.4	2.3	2.2	2.1
	130	0.18	13.2	10.6	8.8	7.5	6.6	5.9	5.3	4.8	4.4	4.1	3.8	3.5	3.3	3.1	2.9	2.8	2.6	2.5	2.4	2.3	2.2
80015 100 MESH TIP SCREEN	20	0.10	7.7	6.2	5.1	4.4	3.9	3.4	3.1	2.8	2.6	2.4	2.2	2.1	1.9	1.8	1.7	1.6	1.5	1.5	1.4	1.3	1.3
	30	0.13	9.5	7.6	6.3	5.4	4.7	4.2	3.8	3.4	3.2	2.9	2.7	2.5	2.4	2.2	2.1	2.0	1.9	1.8	1.7	1.6	1.6
	40	0.15	11.0	8.8	7.3	6.3	5.5	4.9	4.4	4.0	3.7	3.4	3.1	2.9	2.7	2.6	2.4	2.3	2.2	2.1	2.0	1.9	1.8
	50	0.17	12.3	9.9	8.2	7.0	6.2	5.5	4.9	4.5	4.1	3.8	3.5	3.3	3.1	2.9	2.7	2.6	2.5	2.3	2.2	2.1	2.1
	60	0.18	13.5	10.8	9.0	7.7	6.8	6.0	5.4	4.9	4.5	4.2	3.9	3.6	3.4	3.2	3.0	2.8	2.7	2.6	2.5	2.4	2.3
	70	0.20	14.6	11.7	9.8	8.4	7.3	6.5	5.9	5.3	4.9	4.5	4.2	3.9	3.7	3.4	3.3	3.1	2.9	2.8	2.7	2.5	2.4
	80	0.21	15.7	12.5	10.5	9.0	7.8	7.0	6.3	5.7	5.2	4.8	4.5	4.2	3.9	3.7	3.5	3.3	3.1	3.0	2.9	2.7	2.6
	90	0.22	16.7	13.3	11.1	9.5	8.3	7.4	6.7	6.1	5.6	5.1	4.8	4.4	4.2	3.9	3.7	3.5	3.3	3.2	3.0	2.9	2.8
	100	0.24	17.6	14.1	11.7	10.0	8.8	7.8	7.0	6.4	5.9	5.4	5.0	4.7	4.4	4.1	3.9	3.7	3.5	3.3	3.2	3.1	2.9
	110	0.25	18.5	14.8	12.3	10.6	9.2	8.2	7.4	6.7	6.2	5.7	5.3	4.9	4.6	4.3	4.1	3.9	3.7	3.5	3.4	3.2	3.1
	120	0.26	19.3	15.4	12.9	11.0	9.7	8.6	7.7	7.0	6.4	5.9	5.5	5.1	4.8	4.5	4.3	4.1	3.9	3.7	3.5	3.4	3.2
	130	0.27	20.1	16.1	13.4	11.5	10.1	8.9	8.0	7.3	6.7	6.2	5.7	5.4	5.0	4.7	4.5	4.2	4.0	3.8	3.7	3.5	3.4
8002 (50 MESH TIP SCREEN)	20	0.14	10.4	8.4	7.0	6.0	5.2	4.6	4.2	3.8	3.5	3.2	3.0	2.8	2.6	2.5	2.3	2.2	2.1	2.0	1.9	1.8	1.7
	30	0.17	12.8	10.2	8.5	7.3	6.4	5.7	5.1	4.6	4.3	3.9	3.6	3.4	3.2	3.0	2.8	2.7	2.6	2.4	2.3	2.2	2.1
	40	0.20	14.7	11.8	9.8	8.4	7.4	6.6	5.9	5.4	4.9	4.5	4.2	3.9	3.7	3.5	3.3	3.1	2.9	2.8	2.7	2.6	2.5
	50	0.22	16.5	13.2	11.0	9.4	8.2	7.3	6.6	6.0	5.5	5.1	4.7	4.4	4.1	3.9	3.7	3.5	3.3	3.1	3.0	2.9	2.7
	60	0.24	18.1	14.5	12.0	10.3	9.0	8.0	7.2	6.6	6.0	5.6	5.2	4.8	4.5	4.3	4.0	3.8	3.6	3.4	3.3	3.1	3.0
	70	0.26	19.5	15.6	13.0	11.2	9.8	8.7	7.8	7.1	6.5	6.0	5.6	5.2	4.9	4.6	4.3	4.1	3.9	3.7	3.5	3.4	3.3
	80	0.28	20.9	16.7	13.9	11.9	10.4	9.3	8.4	7.6	7.0	6.4	6.0	5.6	5.2	4.9	4.6	4.4	4.2	4.0	3.8	3.6	3.5
	90	0.30	22.2	17.7	14.8	12.7	11.1	9.8	8.9	8.1	7.4	6.8	6.3	5.9	5.5	5.2	4.9	4.7	4.4	4.2	4.0	3.9	3.7
	100	0.31	23.4	18.7	15.6	13.4	11.7	10.4	9.3	8.5	7.8	7.2	6.7	6.2	5.8	5.5	5.2	4.9	4.7	4.5	4.2	4.1	3.9
	110	0.33	24.5	19.6	16.3	14.0	12.3	10.9	9.8	8.9	8.2	7.5	7.0	6.5	6.1	5.8	5.4	5.2	4.9	4.7	4.5	4.3	4.1
	120	0.35	25.6	20.5	17.1	14.6	12.8	11.4	10.2	9.3	8.5	7.9	7.3	6.8	6.4	6.0	5.7	5.4	5.1	4.9	4.7	4.5	4.3
	130	0.36	26.7	21.3	17.8	15.2	13.3	11.9	10.7	9.7	8.9	8.2	7.6	7.1	6.7	6.3	5.9	5.6	5.3	5.1	4.9	4.7	4.4
8003 (50 MESH TIP SCREEN)	20	0.21	15.3	12.3	10.2	8.8	7.7	6.8	6.1	5.6	5.1	4.7	4.4	4.1	3.8	3.6	3.4	3.2	3.1	2.9	2.8	2.7	2.6
	30	0.25	18.8	15.0	12.5	10.7	9.4	8.4	7.5	6.8	6.3	5.8	5.4	5.0	4.7	4.4	4.2	4.0	3.8	3.6	3.4	3.3	3.1
	40	0.29	21.7	17.4	14.5	12.4	10.9	9.7	8.7	7.9	7.2	6.7	6.2	5.8	5.4	5.1	4.8	4.6	4.3	4.1	3.9	3.8	3.6
	50	0.33	24.3	19.4	16.2	13.9	12.1	10.8	9.7	8.8	8.1	7.5	6.9	6.5	6.1	5.7	5.4	5.1	4.9	4.6	4.4	4.2	4.0
	60	0.36	26.6	21.3	17.7	15.2	13.3	11.8	10.6	9.7	8.9	8.2	7.6	7.1	6.7	6.3	5.9	5.6	5.3	5.1	4.8	4.6	4.4
	70	0.39	28.8	23.0	19.2	16.4	14.4	12.8	11.5	10.5	9.6	8.8	8.2	7.7	7.2	6.8	6.4	6.1	5.8	5.5	5.2	5.0	4.8
	80	0.41	30.8	24.6	20.5	17.6	15.4	13.7	12.3	11.2	10.3	9.5	8.8	8.2	7.7	7.2	6.8	6.5	6.2	5.9	5.6	5.3	5.1
	90	0.44	32.6	26.1	21.8	18.6	16.3	14.5	13.1	11.9	10.9	10.0	9.3	8.7	8.2	7.7	7.3	6.9	6.5	6.2	5.9	5.7	5.4
	100	0.46	34.4	27.5	22.9	19.7	17.2	15.3	13.8	12.5	11.5	10.6	9.9	9.2	8.6	8.1	7.6	7.2	6.9	6.6	6.3	6.0	5.7
	110	0.49	36.1	28.9	24.1	20.6	18.0	16.0	14.4	13.1	12.0	11.1	10.3	9.6	9.0	8.5	8.0	7.6	7.2	6.9	6.6	6.3	6.0
	120	0.51	37.7	30.2	25.1	21.5	18.8	16.8	15.1	13.7	12.6	11.6	10.8	10.1	9.4	8.9	8.4	7.9	7.5	7.2	6.9	6.6	6.3
	130	0.53	39.2	31.4	26.2	22.4	19.6	17.4	15.7	14.3	13.1	12.1	11.2	10.5	9.8	9.2	8.7	8.3	7.8	7.5	7.1	6.8	6.5
8004 (50 MESH TIP SCREEN)	20	0.27	19.7	15.8	13.2	11.3	9.9	8.8	7.9	7.2	6.6	6.1	5.6	5.3	4.9	4.6	4.4	4.2	3.9	3.8	3.6	3.4	3.3
	30	0.33	24.5	19.6	16.3	14.0	12.3	10.9	9.8	8.9	8.2	7.5	7.0	6.5	6.1	5.8	5.4	5.2	4.9	4.7	4.5	4.3	4.1
	40	0.38	28.5	22.8	19.0	16.3	14.3	12.7	11.4	10.4	9.5	8.8	8.1	7.6	7.1	6.7	6.3	6.0	5.7	5.4	5.2	5.0	4.8
	50	0.43	32.0	25.6	21.3	18.3	16.0	14.2	12.8	11.6	10.7	9.8	9.1	8.5	8.0	7.5	7.1	6.7	6.4	6.1	5.8	5.6	5.3
	60	0.47	35.2	28.1	23.4	20.1	17.6	15.6	14.1	12.8	11.7	10.8	10.0	9.4	8.8	8.3	7.8	7.4	7.0	6.7	6.4	6.1	5.9
	70	0.51	38.1	30.4	25.4	21.7	19.0	16.9	15.2	13.8	12.7	11.7	10.9	10.1	9.5	9.0	8.5	8.0	7.6	7.2	6.9	6.6	6.3
	80	0.55	40.7	32.6	27.2	23.3	20.4	18.1	16.3	14.8	13.6	12.5	11.6	10.9	10.2	9.6	9.1	8.6	8.1	7.8	7.4	7.1	6.8
	90	0.58	43.3	34.6	28.8	24.7	21.6	19.2	17.3	15.7	14.4	13.3	12.4	11.5	10.8	10.2	9.6	9.1	8.7	8.2	7.9	7.5	7.2
	100	0.61	45.6	36.5	30.4	26.1	22.8	20.3	18.3	16.6	15.2	14.0	13.0	12.2	11.4	10.7	10.1	9.6	9.1	8.7	8.3	7.9	7.6
	110	0.65	47.9	38.3	31.9	27.4	23.9	21.3	19.2	17.4	16.0	14.7	13.7	12.8	12.0	11.3	10.6	10.1	9.6	9.1	8.7	8.3	8.0
	120	0.67	50.1	40.0	33.4	28.6	25.0	22.2	20.0	18.2	16.7	15.4	14.3	13.3	12.5	11.8	11.1	10.5	10.0	9.5	9.1	8.7	8.3

APPLICATION CHART

TIP NO.	LIQUID PRESSURE PSI	CAPACITY 1 NOZZLE GPM	GALLONS PER ACRE – 20" SPACING																			
			4 MPH	5 MPH	6 MPH	7 MPH	8 MPH	9 MPH	10 MPH	11 MPH	12 MPH	13 MPH	14 MPH	15 MPH	16 MPH	17 MPH	18 MPH	19 MPH	20 MPH	21 MPH	22 MPH	23 MPH	24 MPH
8005 (50 MESH TIP SCREEN)	20	0.34	25.1	20.1	16.7	14.4	12.6	11.2	10.0	9.1	8.4	7.7	7.2	6.7	6.3	5.9	5.6	5.3	5.0	4.8	4.6	4.4	4.2
	30	0.41	30.7	24.6	20.5	17.5	15.3	13.6	12.3	11.2	10.2	9.4	8.8	8.2	7.7	7.2	6.8	6.5	6.1	5.8	5.6	5.3	5.1
	40	0.48	35.4	28.3	23.6	20.2	17.7	15.7	14.2	12.9	11.8	10.9	10.1	9.4	8.8	8.3	7.9	7.4	7.1	6.7	6.4	6.2	5.9
	50	0.53	39.5	31.6	26.3	22.6	19.8	17.6	15.8	14.4	13.2	12.2	11.3	10.5	9.9	9.3	8.8	8.3	7.9	7.5	7.2	6.9	6.6
	60	0.58	43.2	34.6	28.8	24.7	21.6	19.2	17.3	15.7	14.4	13.3	12.4	11.5	10.8	10.2	9.6	9.1	8.6	8.2	7.9	7.5	7.2
	70	0.63	46.7	37.3	31.1	26.7	23.3	20.7	18.7	17.0	15.6	14.4	13.3	12.4	11.7	11.0	10.4	9.8	9.3	8.9	8.5	8.1	7.8
	80	0.67	49.8	39.9	33.2	28.5	24.9	22.1	19.9	18.1	16.6	15.3	14.2	13.3	12.5	11.7	11.1	10.5	10.0	9.5	9.1	8.7	8.3
	90	0.71	52.8	42.3	35.2	30.2	26.4	23.5	21.1	19.2	17.6	16.3	15.1	14.1	13.2	12.4	11.7	11.1	10.6	10.1	9.6	9.2	8.8
	100	0.75	55.6	44.5	37.1	31.8	27.8	24.7	22.3	20.2	18.5	17.1	15.9	14.8	13.9	13.1	12.4	11.7	11.1	10.6	10.1	9.7	9.3
	110	0.79	58.3	46.7	38.9	33.3	29.2	25.9	23.3	21.2	19.4	17.9	16.7	15.6	14.6	13.7	13.0	12.3	11.7	11.1	10.6	10.1	9.7
	120	0.82	60.9	48.7	40.6	34.8	30.4	27.1	24.4	22.1	20.3	18.7	17.4	16.2	15.2	14.3	13.5	12.8	12.2	11.6	11.1	10.6	10.1
8006 (50 MESH TIP SCREEN)	20	0.40	29.9	23.9	19.9	17.1	15.0	13.3	12.0	10.9	10.0	9.2	8.5	8.0	7.5	7.0	6.6	6.3	6.0	5.7	5.4	5.2	5.0
	30	0.49	36.7	29.3	24.4	21.0	18.3	16.3	14.7	13.3	12.2	11.3	10.5	9.8	9.2	8.6	8.1	7.7	7.3	7.0	6.7	6.4	6.1
	40	0.57	42.3	33.9	28.2	24.2	21.2	18.8	16.9	15.4	14.1	13.0	12.1	11.3	10.6	10.0	9.4	8.9	8.5	8.1	7.7	7.4	7.1
	50	0.64	47.4	37.9	31.6	27.1	23.7	21.0	18.9	17.2	15.8	14.6	13.5	12.6	11.8	11.1	10.5	10.0	9.5	9.0	8.6	8.2	7.9
	60	0.70	51.9	41.5	34.6	29.6	25.9	23.1	20.8	18.9	17.3	16.0	14.8	13.8	13.0	12.2	11.5	10.9	10.4	9.9	9.4	9.0	8.6
	70	0.75	56.0	44.8	37.4	32.0	28.0	24.9	22.4	20.4	18.7	17.2	16.0	14.9	14.0	13.2	12.5	11.8	11.2	10.7	10.2	9.7	9.3
	80	0.81	59.9	47.9	39.9	34.2	30.0	26.6	24.0	21.8	20.0	18.4	17.1	16.0	15.0	14.1	13.3	12.6	12.0	11.4	10.9	10.4	10.0
	90	0.86	63.5	50.8	42.4	36.3	31.8	28.2	25.4	23.1	21.2	19.6	18.2	16.9	15.9	15.0	14.1	13.4	12.7	12.1	11.6	11.1	10.6
	100	0.90	67.0	53.6	44.7	38.3	33.5	29.8	26.8	24.4	22.3	20.6	19.1	17.9	16.7	15.8	14.9	14.1	13.4	12.8	12.2	11.6	11.2
	110	0.95	70.2	56.2	46.8	40.1	35.1	31.2	28.1	25.5	23.4	21.6	20.1	18.7	17.6	16.5	15.6	14.8	14.0	13.4	12.8	12.2	11.7
	120	0.99	73.4	58.7	48.9	41.9	36.7	32.6	29.3	26.7	24.5	22.6	21.0	19.6	18.3	17.3	16.3	15.4	14.7	14.0	13.3	12.8	12.2
8008 (50 MESH TIP SCREEN)	20	0.52	38.9	31.1	25.9	22.2	19.4	17.3	15.5	14.1	13.0	12.0	11.1	10.4	9.7	9.1	8.6	8.2	7.8	7.4	7.1	6.8	6.5
	30	0.64	47.6	38.1	31.7	27.2	23.8	21.2	19.0	17.3	15.9	14.6	13.6	12.7	11.9	11.2	10.6	10.0	9.5	9.1	8.7	8.3	7.9
	40	0.74	55.0	44.0	36.6	31.4	27.5	24.4	22.0	20.0	18.3	16.9	15.7	14.7	13.7	12.9	12.2	11.6	11.0	10.5	10.0	9.6	9.2
	50	0.83	61.5	49.2	41.0	35.1	30.7	27.3	24.6	22.3	20.5	18.9	17.6	16.4	15.4	14.5	13.7	12.9	12.3	11.7	11.2	10.7	10.2
	60	0.91	67.3	53.9	44.9	38.5	33.7	29.9	26.9	24.5	22.4	20.7	19.2	18.0	16.8	15.8	15.0	14.2	13.5	12.8	12.2	11.7	11.2
	70	0.98	72.7	58.2	48.5	41.6	36.4	32.3	29.1	26.5	24.2	22.4	20.8	19.4	18.2	17.1	16.2	15.3	14.5	13.9	13.2	12.7	12.1
	80	1.05	77.8	62.2	51.8	44.4	38.9	34.6	31.1	28.3	25.9	23.9	22.2	20.7	19.4	18.3	17.3	16.4	15.6	14.8	14.1	13.5	13.0
	90	1.11	82.5	66.0	55.0	47.1	41.2	36.7	33.0	30.0	27.5	25.4	23.6	22.0	20.6	19.4	18.3	17.4	16.5	15.7	15.0	14.3	13.7
	100	1.17	87.0	69.6	58.0	49.7	43.5	38.7	34.8	31.6	29.0	26.8	24.8	23.2	21.7	20.5	19.3	18.3	17.4	16.6	15.8	15.1	14.5
	110	1.23	91.2	73.0	60.8	52.1	45.6	40.5	36.5	33.2	30.4	28.1	26.1	24.3	22.8	21.5	20.3	19.2	18.2	17.4	16.6	15.9	15.2
8010 NO SCREEN	20	0.61	45.3	36.2	30.2	25.9	22.6	20.1	18.1	16.5	15.1	13.9	12.9	12.1	11.3	10.7	10.1	9.5	9.1	8.6	8.2	7.9	7.5
	30	0.75	55.5	44.4	37.0	31.7	27.7	24.7	22.2	20.2	18.5	17.1	15.8	14.8	13.9	13.1	12.3	11.7	11.1	10.6	10.1	9.6	9.2
	40	0.86	64.1	51.3	42.7	36.6	32.0	28.5	25.6	23.3	21.4	19.7	18.3	17.1	16.0	15.1	14.2	13.5	12.8	12.2	11.6	11.1	10.7
	50	0.97	71.7	57.3	47.8	40.9	35.8	31.8	28.7	26.1	23.9	22.0	20.5	19.1	17.9	16.9	15.9	15.1	14.3	13.6	13.0	12.5	11.9
	60	1.06	78.5	62.8	52.3	44.9	39.3	34.9	31.4	28.6	26.2	24.2	22.4	20.9	19.6	18.5	17.4	16.5	15.7	15.0	14.3	13.7	13.1
	70	1.14	84.8	67.9	56.5	48.5	42.4	37.7	33.9	30.8	28.3	26.1	24.2	22.6	21.2	20.0	18.8	17.9	17.0	16.2	15.4	14.8	14.1
	80	1.22	90.7	72.6	60.5	51.8	45.3	40.3	36.3	33.0	30.2	27.9	25.9	24.2	22.7	21.3	20.2	19.1	18.1	17.3	16.5	15.8	15.1
	90	1.30	96.2	77.0	64.1	55.0	48.1	42.8	38.5	35.0	32.1	29.6	27.5	25.7	24.1	22.6	21.4	20.3	19.2	18.3	17.5	16.7	16.0
	100	1.37	101	81.1	67.6	58.0	50.7	45.1	40.6	36.9	33.8	31.2	29.0	27.0	25.4	23.9	22.5	21.4	20.3	19.3	18.4	17.6	16.9

APPLICATION CHART

TIP NO.	LIQUID PRESSURE KPa	NOZZLE CAPACITY L/min	LITERS PER HECTARE – 50.8 cm SPACING																	
			6 km/hr	8 km/hr	10 km/hr	12 km/hr	14 km/hr	16 km/hr	18 km/hr	20 km/hr	22 km/hr	24 km/hr	26 km/hr	28 km/hr	30 km/hr	32 km/hr	34 km/hr	36 km/hr	38 km/hr	40 km/hr
8001 (100 MESH TIP SCREEN)	150	0.28	54.7	41.0	32.8	27.3	23.4	20.5	18.2	16.4	14.9	13.7	12.6	11.7	10.9	10.3	9.6	9.1	8.6	8.2
	200	0.32	63.1	47.4	37.9	31.6	27.1	23.7	21.0	18.9	17.2	15.8	14.6	13.5	12.6	11.8	11.1	10.5	10.0	9.5
	250	0.36	70.6	52.9	42.4	35.3	30.3	26.5	23.5	21.2	19.3	17.6	16.3	15.1	14.1	13.2	12.5	11.8	11.1	10.6
	300	0.39	77.3	58.0	46.4	38.7	33.1	29.0	25.8	23.2	21.1	19.3	17.8	16.6	15.5	14.5	13.6	12.9	12.2	11.6
	350	0.42	83.5	62.6	50.1	41.8	35.8	31.3	27.8	25.1	22.8	20.9	19.3	17.9	16.7	15.7	14.7	13.9	13.2	12.5
	400	0.45	89.3	67.0	53.6	44.6	38.3	33.5	29.8	26.8	24.4	22.3	20.6	19.1	17.9	16.7	15.8	14.9	14.1	13.4
	450	0.48	94.7	71.0	56.8	47.4	40.6	35.5	31.6	28.4	25.8	23.7	21.9	20.3	18.9	17.8	16.7	15.8	15.0	14.2
	500	0.51	99.8	74.9	59.9	49.9	42.8	37.4	33.3	29.9	27.2	25.0	23.0	21.4	20.0	18.7	17.6	16.6	15.8	15.0
	550	0.53	104.7	78.5	62.8	52.4	44.9	39.3	34.9	31.4	28.6	26.2	24.2	22.4	20.9	19.6	18.5	17.5	16.5	15.7
	600	0.56	109.4	82.0	65.6	54.7	46.9	41.0	36.5	32.8	29.8	27.3	25.2	23.4	21.9	20.5	19.3	18.2	17.3	16.4
	650	0.58	113.8	85.4	68.3	56.9	48.8	42.7	37.9	34.1	31.0	28.5	26.3	24.4	22.8	21.3	20.1	19.0	18.0	17.1
	700	0.60	118.1	88.6	70.9	59.1	50.6	44.3	39.4	35.4	32.2	29.5	27.3	25.3	23.6	22.1	20.8	19.7	18.7	17.7
	750	0.62	122.3	91.7	73.4	61.1	52.4	45.8	40.8	36.7	33.3	30.6	28.2	26.2	24.5	22.9	21.6	20.4	19.3	18.3
	800	0.64	126.3	94.7	75.8	63.1	54.1	47.4	42.1	37.9	34.4	31.6	29.1	27.1	25.3	23.7	22.3	21.0	19.9	18.9
	850	0.66	130.2	97.6	78.1	65.1	55.8	48.8	43.4	39.0	35.5	32.5	30.0	27.9	26.0	24.4	23.0	21.7	20.6	19.5
	900	0.68	133.9	100.5	80.4	67.0	57.4	50.2	44.6	40.2	36.5	33.5	30.9	28.7	26.8	25.1	23.6	22.3	21.1	20.1
80015 (100 MESH TIP SCREEN)	150	0.42	82.0	61.5	49.2	41.0	35.2	30.8	27.3	24.6	22.4	20.5	18.9	17.6	16.4	15.4	14.5	13.7	13.0	12.3
	200	0.48	94.7	71.0	56.8	47.4	40.6	35.5	31.6	28.4	25.8	23.7	21.9	20.3	18.9	17.8	16.7	15.8	15.0	14.2
	250	0.54	105.9	79.4	63.5	52.9	45.4	39.7	35.3	31.8	28.9	26.5	24.4	22.7	21.2	19.9	18.7	17.6	16.7	15.9
	300	0.59	116.0	87.0	69.6	58.0	49.7	43.5	38.7	34.8	31.6	29.0	26.8	24.9	23.2	21.7	20.5	19.3	18.3	17.4
	350	0.64	125.3	94.0	75.2	62.6	53.7	47.0	41.8	37.6	34.2	31.3	28.9	26.8	25.1	23.5	22.1	20.9	19.8	18.8
	400	0.68	133.9	100.5	80.4	67.0	57.4	50.2	44.6	40.2	36.5	33.5	30.9	28.7	26.8	25.1	23.6	22.3	21.1	20.1
	450	0.72	142.1	106.5	85.2	71.0	60.9	53.3	47.4	42.6	38.7	35.5	32.8	30.4	28.4	26.6	25.1	23.7	22.4	21.3
	500	0.76	149.7	112.3	89.8	74.9	64.2	56.2	49.9	44.9	40.8	37.4	34.6	32.1	29.9	28.1	26.4	25.0	23.6	22.5
	550	0.80	157.1	117.8	94.2	78.5	67.3	58.9	52.4	47.1	42.8	39.3	36.2	33.7	31.4	29.4	27.7	26.2	24.8	23.6
	600	0.83	164.0	123.0	98.4	82.0	70.3	61.5	54.7	49.2	44.7	41.0	37.9	35.2	32.8	30.8	28.9	27.3	25.9	24.6
	650	0.87	170.7	128.1	102.4	85.4	73.2	64.0	56.9	51.2	46.6	42.7	39.4	36.6	34.1	32.0	30.1	28.5	27.0	25.6
	700	0.90	177.2	132.9	106.3	88.6	75.9	66.4	59.1	53.2	48.3	44.3	40.9	38.0	35.4	33.2	31.3	29.5	28.0	26.6
	750	0.93	183.4	137.5	110.0	91.7	78.6	68.8	61.1	55.0	50.0	45.8	42.3	39.3	36.7	34.4	32.4	30.6	29.0	27.5
	800	0.96	189.4	142.1	113.6	94.7	81.2	71.0	63.1	56.8	51.7	47.4	43.7	40.6	37.9	35.5	33.4	31.6	29.9	28.4
	850	0.99	195.2	146.4	117.1	97.6	83.7	73.2	65.1	58.6	53.2	48.8	45.1	41.8	39.0	36.6	34.5	32.5	30.8	29.3
	900	1.02	200.9	150.7	120.5	100.5	86.1	75.3	67.0	60.3	54.8	50.2	46.4	43.1	40.2	37.7	35.5	33.5	31.7	30.1
8002 (50 MESH TIP SCREEN)	150	0.56	109	82	66	55	47	41	36	33	30	27	25	23	22	21	19	18	17	16
	200	0.64	126	95	76	63	54	47	42	38	34	32	29	27	25	24	22	21	20	19
	250	0.72	141	106	85	70	60	53	47	42	38	35	33	30	28	26	25	23	22	21
	300	0.78	154	116	93	77	66	58	51	46	42	39	36	33	31	29	27	26	24	23
	350	0.85	166	125	100	83	71	62	55	50	45	42	38	36	33	31	29	28	26	25
	400	0.90	178	133	107	89	76	67	59	53	49	44	41	38	36	33	31	30	28	27
	450	0.96	189	141	113	94	81	71	63	57	51	47	44	40	38	35	33	31	30	28
	500	1.01	199	149	119	99	85	75	66	60	54	50	46	43	40	37	35	33	31	30
	550	1.06	208	156	125	104	89	78	69	63	57	52	48	45	42	39	37	35	33	31
	600	1.11	218	163	131	109	93	82	73	65	59	54	50	47	44	41	38	36	34	33
	650	1.15	227	170	136	113	97	85	76	68	62	57	52	49	45	42	40	38	36	34
	700	1.19	235	176	141	118	101	88	78	71	64	59	54	50	47	44	41	39	37	35
	750	1.24	243	182	146	122	104	91	81	73	66	61	56	52	49	46	43	41	38	36
	800	1.28	251	188	151	126	108	94	84	75	69	63	58	54	50	47	44	42	40	38
	850	1.32	259	194	155	129	111	97	86	78	71	65	60	55	52	49	46	43	41	39
	900	1.35	266	200	160	133	114	100	89	80	73	67	61	57	53	50	47	44	42	40
8003 (50 MESH TIP SCREEN)	150	0.82	162	121	97	81	69	61	54	48	44	40	37	35	32	30	29	27	26	24
	200	0.95	187	140	112	93	80	70	62	56	51	47	43	40	37	35	33	31	29	28
	250	1.06	209	156	125	104	89	78	70	63	57	52	48	45	42	39	37	35	33	31
	300	1.16	228	171	137	114	98	86	76	69	62	57	53	49	46	43	40	38	36	34
	350	1.25	247	185	148	123	106	93	82	74	67	62	57	53	49	46	44	41	39	37
	400	1.34	264	198	158	132	113	99	88	79	72	66	61	57	53	49	47	44	42	40
	450	1.42	280	210	168	140	120	105	93	84	76	70	65	60	56	52	49	47	44	42
	500	1.50	295	221	177	147	126	111	98	88	80	74	68	63	59	55	52	49	47	44
	550	1.57	309	232	186	155	133	116	103	93	84	77	71	66	62	58	55	52	49	46
	600	1.64	323	242	194	162	138	121	108	97	88	81	75	69	65	61	57	54	51	48
	650	1.71	336	252	202	168	144	126	112	101	92	84	78	72	67	63	59	56	53	50
	700	1.77	349	262	209	174	150	131	116	105	95	87	81	75	70	65	62	58	55	52
	750	1.83	361	271	217	181	155	135	120	108	99	90	83	77	72	68	64	60	57	54
	800	1.90	373	280	224	187	160	140	124	112	102	93	86	80	75	70	66	62	59	56

APPLICATION CHART

TIP NO.	LIQUID PRESSURE KPa	NOZZLE CAPACITY L/min	LITERS PER HECTARE – 50.8 cm SPACING																
			6 km/hr	8 km/hr	10 km/hr	12 km/hr	14 km/hr	16 km/hr	18 km/hr	20 km/hr	22 km/hr	24 km/hr	26 km/hr	28 km/hr	30 km/hr	32 km/hr	34 km/hr	36 km/hr	38 km/hr	40 km/hr
8004 (50 MESH TIP SCREEN)	150	1.07	210	158	126	105	90	79	70	63	57	53	49	45	42	39	37	35	33	32
	200	1.24	244	183	146	122	105	91	81	73	67	61	56	52	49	46	43	41	39	37
	250	1.39	274	205	164	137	117	103	91	82	75	68	63	59	55	51	48	46	43	41
	300	1.53	300	225	180	150	129	113	100	90	82	75	69	64	60	56	53	50	47	45
	350	1.65	325	244	195	162	139	122	108	97	89	81	75	70	65	61	57	54	51	49
	400	1.77	348	261	209	174	149	130	116	104	95	87	80	75	70	65	61	58	55	52
	450	1.88	369	277	221	185	158	138	123	111	101	92	85	79	74	69	65	62	58	55
	500	1.98	389	292	234	195	167	146	130	117	106	97	90	83	78	73	69	65	61	58
	550	2.08	409	306	245	204	175	153	136	123	111	102	94	88	82	77	72	68	65	61
	600	2.17	427	320	256	213	183	160	142	128	116	107	99	91	85	80	75	71	67	64
	650	2.26	445	333	267	222	191	167	148	133	121	111	103	95	89	83	78	74	70	67
	700	2.34	461	346	277	231	198	173	154	138	126	115	106	99	92	87	81	77	73	69
	750	2.43	478	358	287	239	205	179	159	143	130	119	110	102	96	90	84	80	75	72
	800	2.51	494	370	296	247	212	185	165	148	135	123	114	106	99	93	87	82	78	74
8005 (50 MESH TIP SCREEN)	150	1.34	264	198	158	132	113	99	88	79	72	66	61	56	53	49	47	44	42	40
	200	1.55	304	228	183	152	130	114	101	91	83	76	70	65	61	57	54	51	48	46
	250	1.73	340	255	204	170	146	128	113	102	93	85	79	73	68	64	60	57	54	51
	300	1.89	373	280	224	186	160	140	124	112	102	93	86	80	75	70	66	62	59	56
	350	2.05	403	302	242	201	173	151	134	121	110	101	93	86	81	75	71	67	64	60
	400	2.19	430	323	258	215	184	161	143	129	117	108	99	92	86	81	76	72	68	65
	450	2.32	456	342	274	228	196	171	152	137	124	114	105	98	91	86	81	76	72	68
	500	2.44	481	361	289	241	206	180	160	144	131	120	111	103	96	90	85	80	76	72
	550	2.56	505	378	303	252	216	189	168	151	138	126	116	108	101	95	89	84	80	76
	600	2.68	527	395	316	264	226	198	176	158	144	132	122	113	105	99	93	88	83	79
	650	2.79	549	411	329	274	235	206	183	165	150	137	127	118	110	103	97	91	87	82
	700	2.89	569	427	342	285	244	214	190	171	155	142	131	122	114	107	100	95	90	85
	750	2.99	589	442	354	295	253	221	196	177	161	147	136	126	118	110	104	98	93	88
	800	3.09	609	456	365	304	261	228	203	183	166	152	140	130	122	114	107	101	96	91
8006 (50 MESH TIP SCREEN)	150	1.60	314	235	188	157	135	118	105	94	86	78	72	67	63	59	55	52	50	47
	200	1.84	363	272	218	181	155	136	121	109	99	91	84	78	73	68	64	60	57	54
	250	2.06	405	304	243	203	174	152	135	122	111	101	94	87	81	76	72	68	64	61
	300	2.26	444	333	266	222	190	167	148	133	121	111	102	95	89	83	78	74	70	67
	350	2.44	480	360	288	240	206	180	160	144	131	120	111	103	96	90	85	80	76	72
	400	2.60	513	385	308	256	220	192	171	154	140	128	118	110	103	96	90	85	81	77
	450	2.76	544	408	326	272	233	204	181	163	148	136	126	117	109	102	96	91	86	82
	500	2.91	573	430	344	287	246	215	191	172	156	143	132	123	115	107	101	96	91	86
	550	3.05	601	451	361	301	258	225	200	180	164	150	139	129	120	113	106	100	95	90
	600	3.19	628	471	377	314	269	235	209	188	171	157	145	135	126	118	111	105	99	94
	650	3.32	654	490	392	327	280	245	218	196	178	163	151	140	131	123	115	109	103	98
	700	3.45	678	509	407	339	291	254	226	203	185	170	157	145	136	127	120	113	107	102
	750	3.57	702	527	421	351	301	263	234	211	191	176	162	150	140	132	124	117	111	105
	800	3.68	725	544	435	363	311	272	242	218	198	181	167	155	145	136	128	121	114	109
8008 (50 MESH TIP SCREEN)	150	2.05	403	302	242	201	173	151	134	121	110	101	93	86	81	76	71	67	64	60
	200	2.36	465	349	279	233	199	174	155	140	127	116	107	100	93	87	82	78	73	70
	250	2.64	520	390	312	260	223	195	173	156	142	130	120	111	104	98	92	87	82	78
	300	2.89	570	427	342	285	244	214	190	171	155	142	131	122	114	107	101	95	90	85
	350	3.13	615	462	369	308	264	231	205	185	168	154	142	132	123	115	109	103	97	92
	400	3.34	658	493	395	329	282	247	219	197	179	164	152	141	132	123	116	110	104	99
	450	3.55	698	523	419	349	299	262	233	209	190	174	161	150	140	131	123	116	110	105
	500	3.74	736	552	441	368	315	276	245	221	201	184	170	158	147	138	130	123	116	110
	550	3.92	772	579	463	386	331	289	257	231	210	193	178	165	154	145	136	129	122	116
	600	4.09	806	604	484	403	345	302	269	242	220	201	186	173	161	151	142	134	127	121
	650	4.26	839	629	503	419	359	315	280	252	229	210	194	180	168	157	148	140	132	126
	700	4.42	870	653	522	435	373	326	290	261	237	218	201	187	174	163	154	145	137	131
	750	4.58	901	676	541	450	386	338	300	270	246	225	208	193	180	169	159	150	142	135
8010 NO SCREEN	150	2.42	476	357	286	238	204	178	159	143	130	119	110	102	95	89	84	79	75	71
	200	2.79	550	412	330	275	236	206	183	165	150	137	127	118	110	103	97	92	87	82
	250	3.12	614	461	369	307	263	230	205	184	168	154	142	132	123	115	108	102	97	92
	300	3.42	673	505	404	337	288	252	224	202	184	168	155	144	135	126	119	112	106	101
	350	3.69	727	545	436	363	312	273	242	218	198	182	168	156	145	136	128	121	115	109
	400	3.95	777	583	466	389	333	291	259	233	212	194	179	167	155	146	137	130	123	117
	450	4.19	824	618	495	412	353	309	275	247	225	206	190	177	165	155	145	137	130	124
	500	4.41	869	652	521	434	372	326	290	261	237	217	201	186	174	163	153	145	137	130
	550	4.63	911	683	547	456	391	342	304	273	249	228	210	195	182	171	161	152	144	137
	600	4.84	952	714	571	476	408	357	317	286	260	238	220	204	190	178	168	159	150	143
	650	5.03	991	743	594	495	425	372	330	297	270	248	229	212	198	186	175	165	158	149
	700	5.22	1028	771	617	514	441	386	343	308	280	257	237	220	206	193	181	171	162	154
	750	5.41	1064	798	639	532	456	399	355	319	290	266	246	228	213	200	188	177	168	160

SUMMARY OF PREPARING AND OPERATING THE SPRA-COUPE

1. Calibrate the Spra-Coupe for speed and application rate. (See pages 14 thru 16.)

2. Adjust the boom height to obtain the correct overlap of the spray pattern for the field to be sprayed. (See page 17.)

3. Fill the Spray tank with water. (See page 13.)

4. Add chemical solution according to the manufacturer's recommendations.

⚠ WARNING

AVOID INJURY OR DEATH

Agricultural chemicals are hazardous. Improper selection or use can seriously injure people, animals, plants, soil, etc. Follow instructions from manufacturer on how to select, apply and handle each chemical.

5. Shift transmission to neutral and engage the hand brake.

6. Place the boom selector switches in the "off" position. (See page 12.)

7. Start the engine and allow to warm.

8. Place the pump switch in the "on" position. Check for pressure reading on the pressure gauge to assure that the pump is primed. (See page 12.)

9. With pump primed and water circulating, increase engine speed (RPM) and agitate mixture (if agitation if required). When solution is thoroughly mixed, turn the spray pump "off."

10. Shift transmission into 1st or 2nd gear and release the hand brake.

11. Place desired boom selector switches in the "on" position.

12. Place pump switch to "on" position. When spray appears at nozzle tips, release clutch pedal and accelerate to full throttle using the foot throttle control.

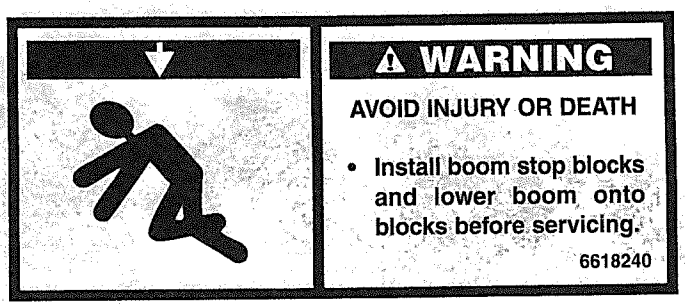
    Always use the foot throttle to start the machine in motion and when shifting gears. Use of the hand throttle is to be limited to longer straight stretches in the field after machine is in motion and at full throttle in the operating gear desired. As you approach the end of the field, depress the foot pedal and place the hand throttle in the "idle" position. Use the foot throttle to control the speed of the Spra-Coupe through the turn.

IMPORTANT

Do not ride the clutch to control the speed of the Spra-Coupe through turns. Riding the clutch will severely shorten the life of the clutch.

13. Use the boom selector switches or pump switch to "stop" and "start" spray during operation.

14. When the spray tank is emptied, turn the pump "off" and repeat steps 3 thru 14.



ADJUSTING THE BOOM

There are five adjustments on the boom assembly.

1. Boom Pitch Adjustment
2. Outer Boom Breakaway Adjustment
3. Boom Height Adjustment
4. Lift Cable Length Adjustment
5. Boom Roller Adjustment

Install the boom roller stop blocks and lower the boom into blocks before working on or near the boom assembly.

To install boom roller stop blocks:

a). Raise the boom until the lower end of the roller bracket is positioned above the upper holes in the roller channel **[A].** To raise the boom see **"BOOM HEIGHT CONTROL"** section on page 10.

b). Remove stop blocks **[A]** (Inset A) and install to the inside of the channel using upper holes. Secure with spring pin **[A]** (Item 1) as shown.

c). Lower the boom onto the blocks. To lower boom, see **"BOOM HEIGHT CONTROL"** section on page 10.

Boom Pitch Adjustment

With the boom hoses empty of water, the end of the outer booms should be positioned from 6 in. (15.24cm) to 8 in. (20.32cm) higher than at the base of the inner boom.

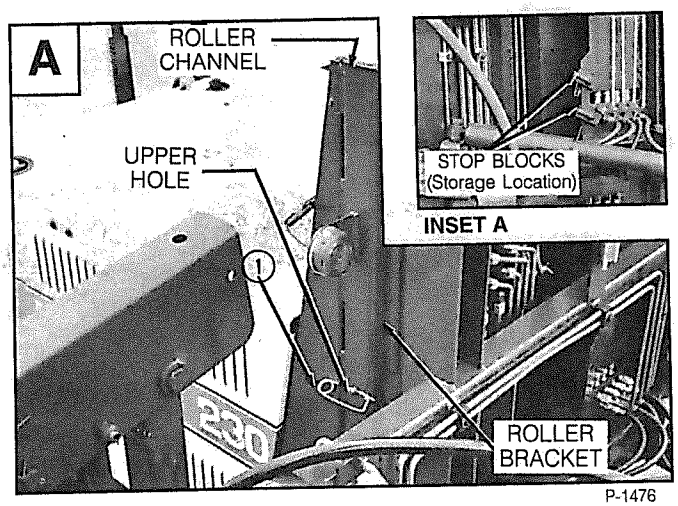
If boom hoses contain water, the booms should be adjusted parallel with the ground.

To adjust boom pitch, turn hex nuts on the end of the boom spring eye bolt **[B]** (Item 1) until correct pitch is obtained.

Outer Boom Breakaway Adjustment

The outer boom is designed to disengage at the spring latch **[C]** when striking an obstacle during operation. When disengaged, the boom can swing rearward until the stop block **[D]** contacts the boom return stop and return forward to the locked position automatically.

If the outer boom engages and disengages from the latch assembly with difficulty (or too easily), the latch spring tension will require readjustment. Readjust the nut **[D]** at the end of the latch spring until correct breakaway and reset operation is obtained.



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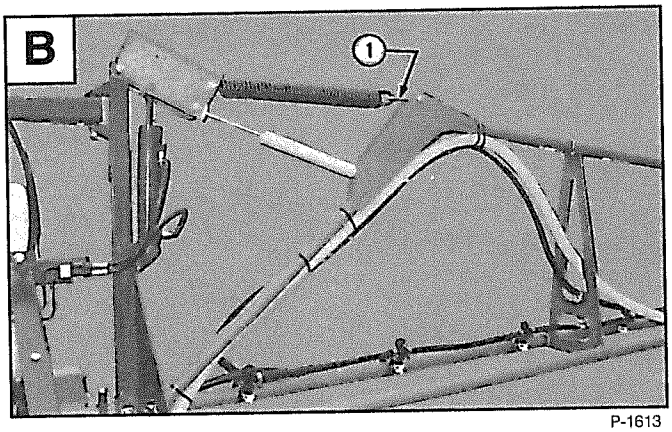

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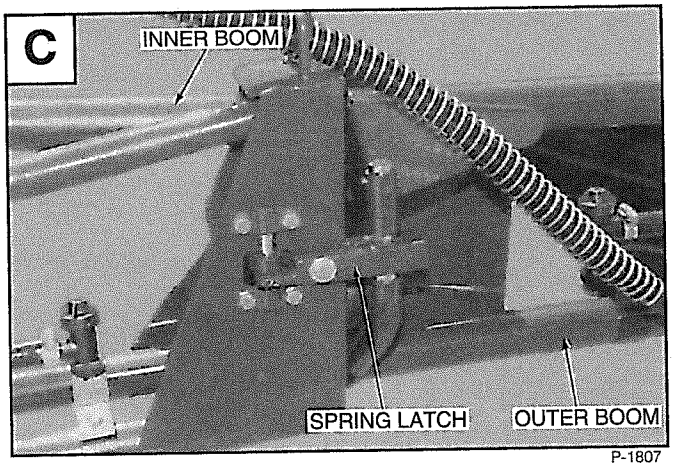

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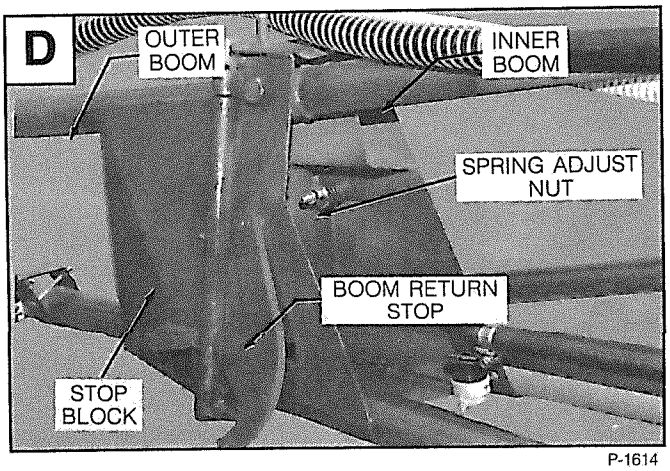

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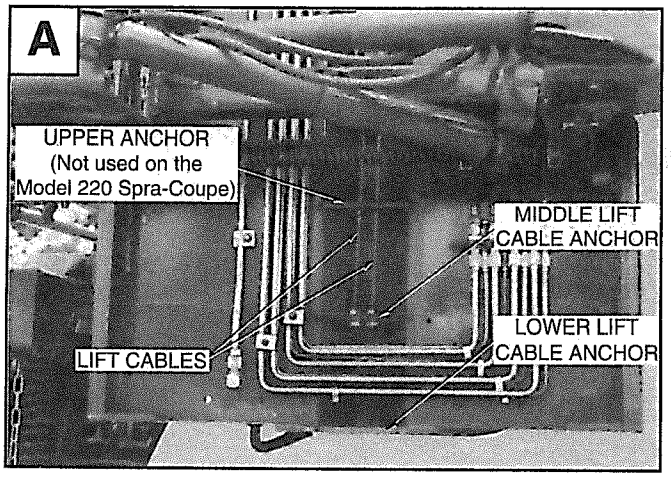
Boom Height Adjustment

The distance between the spray tips and ground can easily be varied using the boom height control switch on the instrument panel.

The minimum to maximum height that the boom will travel is determined by the mounting position of:

a). The lift cables
b). The boom roller brackets

Table 1 (below) outlines the adjustable boom height capability that can be obtained with the various lift cable and roller bracket mounting position combinations. (The dimensions shown are approximate and may vary slightly from the actual on your machine.)



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⚠ WARNING

AVOID INJURY

Bystanders must stay out of reach of boom area when boom lift cylinder is in use.

1. Changing Lift Cable Position

☛NOTE: The Model 220 Spra-Coupe uses the lower and middle lift cable anchor only [A]. The upper anchor is not used on the Model 220.

To change the lift cable position:

a). Install roller bracket stop blocks and lower boom onto the blocks. See **"ADJUSTING THE BOOMS"** section on page 24.

b). Remove the lift cables **[A]** from their current anchored location.

c). Install cables in the alternate cable anchor **[A]** and secure.

If the lower anchor is used, the cables must route through the holes in the upper and middle anchors. Reassemble so jam nuts are installed on the top side of the anchor.

d). Raise the boom and remove stop blocks. Reinstall in storage holes **[A]** (Inset A) (page 24) for future access.

e). Refer to the **"LIFT CABLE LENGTH ADJUSTMENT"** section on page 27 and adjust if required.

CABLE POSITION	ROLLER BRACKET POSITION ON BOOM MAIN FRAME	LOW HEIGHT CAPABILITY	HIGH HEIGHT CAPABILITY
MIDDLE	UPPER	22 in. (55.9cm)	57 in. (144.8cm)
LOWER	LOWER	29 in. (73.7 cm)	64 in. (162.6cm)
The above dimensions are with the spray tank empty and standard rear 7.50 x 16 "General" Mud grip tires installed.			

Table 1: Boom Height Settings

Boom Height Adjustment (Cont'd.)

2. Changing The Roller Bracket Position

The boom roller brackets **[C]** can be mounted to the boom main frame using the upper or lower sets of holes depending on the boom height capability desired.

To change the mounting location of the roller brackets;

1. Open the booms to approximately 45 degrees or until booms clear the fender assemblies.

2. Place boom support stands (or barrels) under the outer boom and inner boom hinges on both the left and right boom assemblies **[A],** then lower the boom onto the supports.

3. Securely attach chains from an overhead hoist around the top boom frame tube and through inside both left and right frame mounting channels **[A]** (Inset A). Raise the hoist to remove slack from the chains.

4. Remove the boom main frame mounting bolts (6 per side) **[B].**

5. Reposition roller brackets in the alternate upper or lower mounting position and reinstall original hardware.

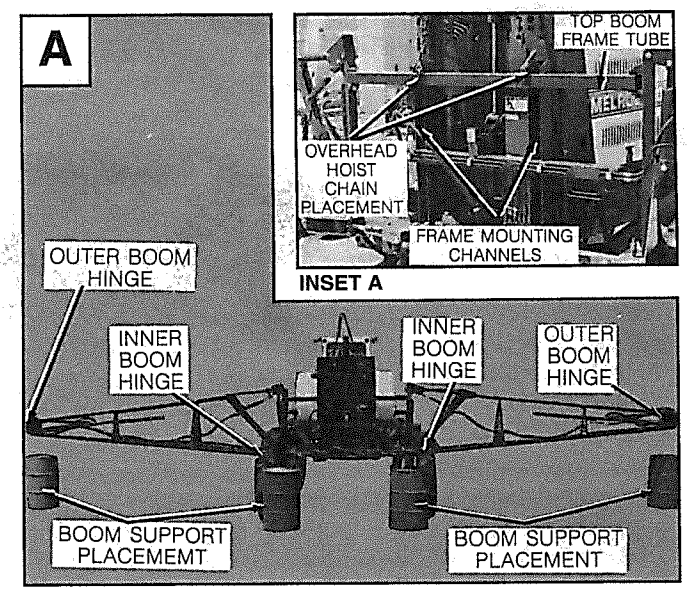
6. Adjust roller brackets upward to tighten the roller within the roller channels then secure hardware. Tighten to 40 ft. lbs. (54 N'm).

7. Remove all block and supports used in steps 3 and 4 above.

8. Refer to **"BOOM PITCH ADJUSTMENT"** section on page 24 and readjust the boom support spring [A] tension.

9. Refer to **"LIFT CABLE LENGTH ADJUSTMENT"** section on page 27 and adjust if required.

10. Refer to **"BOOM ROLLER ADJUSTMENT"** section on page 27 and adjust if required.



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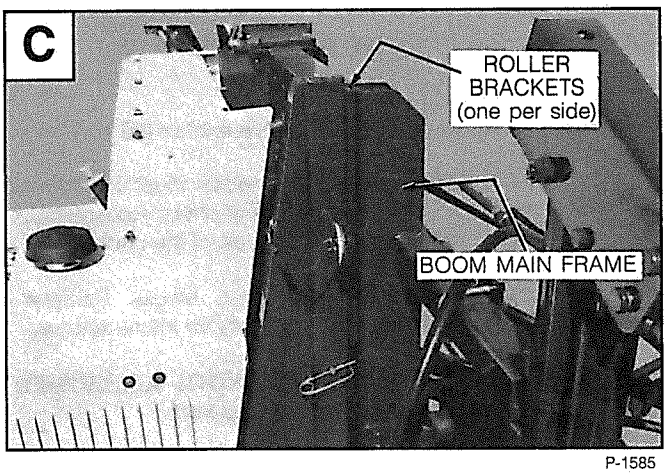
P-1615



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Boom Roller Adjustment

The rollers on the boom main frame may need to be adjusted if:

a). The boom rollers bind with the roller channels while the booms are raised or lowered or ...

b). Too much play is observed between the rollers and roller channels (apparent by excessive "rocking" motion of the boom assembly).

To properly adjust, use the following procedure:

a). Extend the booms, and securely block boom mainframe.

b). Loosen the boom main frame mounting bolts **[A].**

c). Adjust roller bracket upward to tighten (or downward to loosen) the rollers within the roller channel then secure the mounting bolts. Tighten to 40 ft. lbs. (54 N'm).

d). Raise and lower the boom (using the boom height control switch) the full length of the boom support to check for binding or excessive roller clearance. Readjust if necessary.

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Lift Cable Length Adjustment

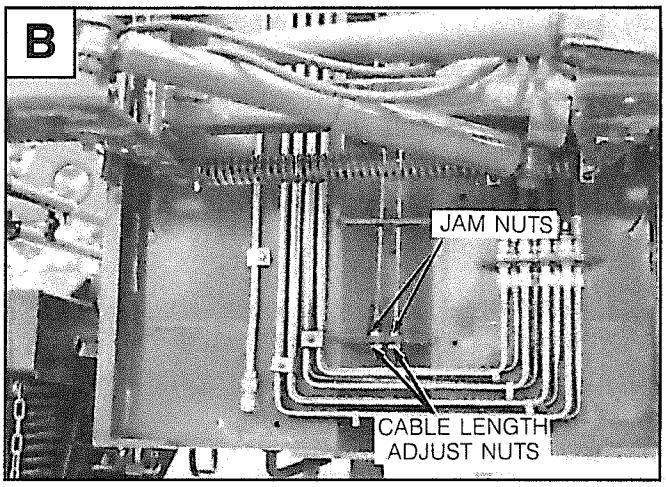
The length of the boom lift cables are to be equally adjusted so the boom roller brackets do not make contact with the upper or lower ends of the boom support when the lift cylinder is fully retracted or extended.

If contact is made at either end of the boom support, cable length adjustment is required.

To adjust:

a). Loosen the jam nuts then turn the adjust nut **[B]** at both ends of the cables equally until the roller brackets clear the end of the boom support when the lift cylinder is fully cycled in both directions.

Secure cable adjusting nuts and jam nuts when adjustment is complete.



P-1616

Rear Wheel Spacing Adjustment

IMPORTANT

Do not adjust the rear wheel spacing wider than that stated below for the axle being used on the Spra-Coupe.

Inadequate engagement of the male and female axles may cause damage or failure of the axle.

The Model 220-72" Spra-Coupe rear tread width (from center to center of tires) can be adjusted from 72" (182.9cm) to 87.25" (221.6cm) (w/rims reversed) when using the standard axle.

Figure **[B]** illustrates the tread widths that can be obtained with the various main frame tube and fender assembly tube hole alignments.

The Model 220-78" Spra-Coupe rear tread width (from center to center of tires) can be adjusted from 78" (198.1cm) to 101.25" (257.2cm) (w/rims reversed) when using the standard axle.

Figure **[C]** illustrates the tread widths that can be obtained with the various main frame tube and fender assembly tube hole alignments.

☛NOTE: See page 29 for rear wheel spacing capabilities with other than standard extension axles.

Rear Wheel Adjustment Procedure

To adjust the rear tread width:

1. Raise the rear of the Spra-Coupe and securely block.
2. Remove bolt **[A]** (Item 1) and slide the final drive assembly (Item 2) to the desired position.
3. Align holes and reinstall shim(s) (if previously required).
4. Reinstall bolt and hardware (Item 1). Tighten to 125 ft. lbs. (170 N'm).
5. Repeat the same procedure on the opposite side.

Wide Front Wheel Spacing Adjustment

The wide front wheel tread width (from center to center of tires) can be adjusted in 4" (10.16cm) increments.

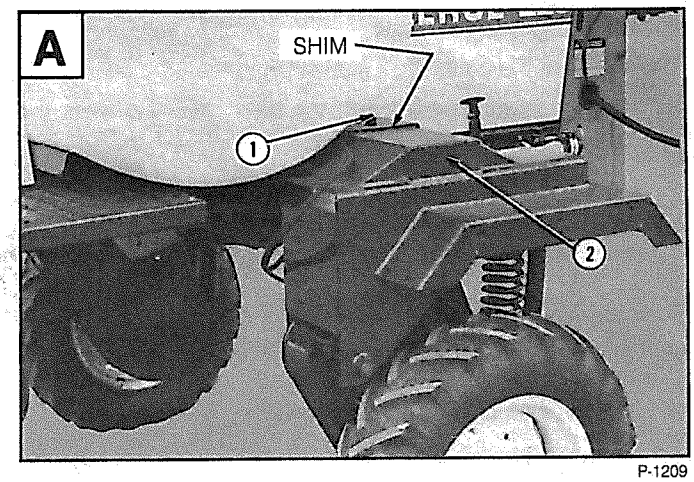
Model 220-72" 72" (182.9cm) to 96" (243.8cm)
Model 220-78" 80" (203.2cm) to 108" (274.3cm)

Front Wheel Adjustment Procedure

1. Raise the front of the Spra-Coupe and securely block.
2. Loosen the tie rod clamps **[D]** (Item 1).
3. Remove adjustment bolts (Item 2).
4. Set the front tire for the spacing desired.
5. Reinstall adjustment bolts (Item 2) and tighten to 40 ft. lbs. (54.24 N'm).

☛NOTE: The front wheel toe-in requires readjustment each time the front wheel spacing is changed. See "WIDE FRONT TOE-IN ADJUSTMENT" section on page 45.

Retighten tie rod clamps **[D]** (Item 1) after toe-in is readjusted.



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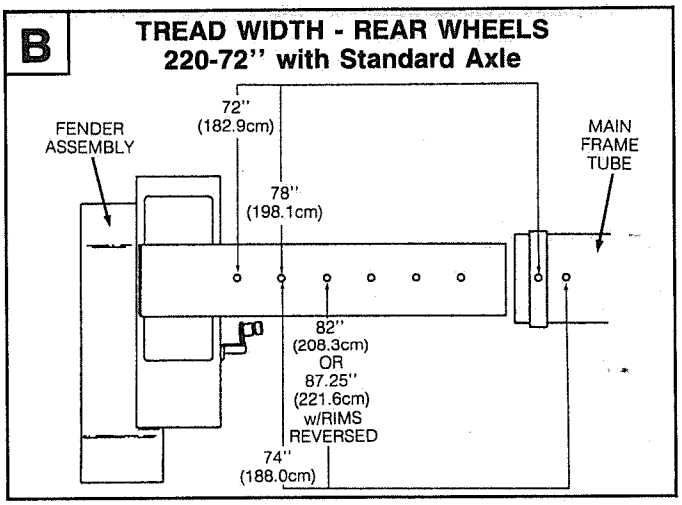

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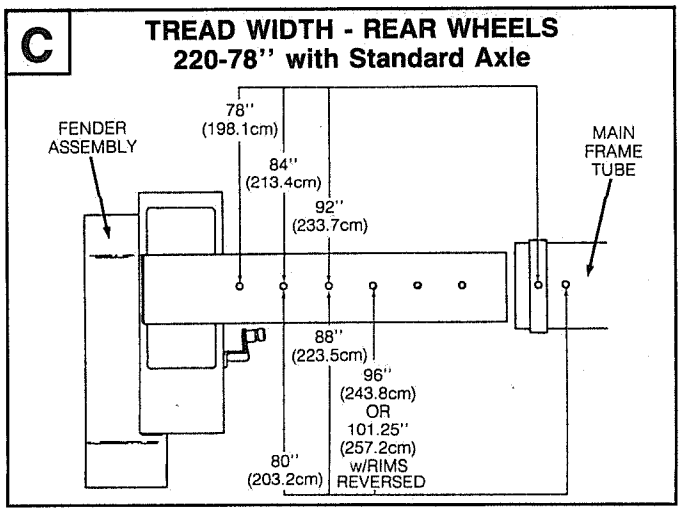

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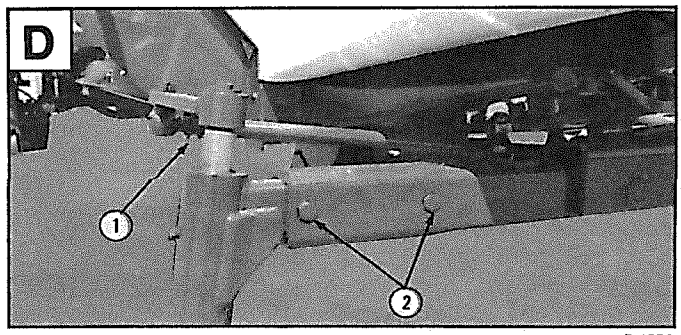

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Rear Wheel Spacings
(with other than standard axles)

IMPORTANT

Do not adjust the rear wheel spacing wider than that stated below for the axle being used on the Spra-Coupe.

Inadequate engagement of the male and female axles may cause damage or failure of the axle.

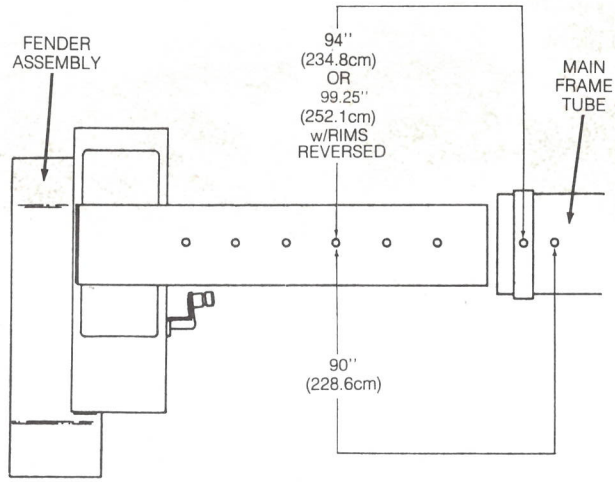
Model 220-72''—A rear extension axle is available for the Model 220-72'' Spra-Coupe.

Figure **[A]** illustrates the tread widths that can be obtained when the extension axle is used on the Model 220-72'' Spra-Coupe.

Model 220-78''—A rear extension axle is available for the Model 220-78'' Spra-Coupe.

Figure **[B]** illustrates the tread widths that can be obtained when the extension axle is used on the Model 220-78'' Spra-Coupe.

A **TREAD WIDTH - REAR WHEELS**
220-72'' With Extension Axles (Accessory)



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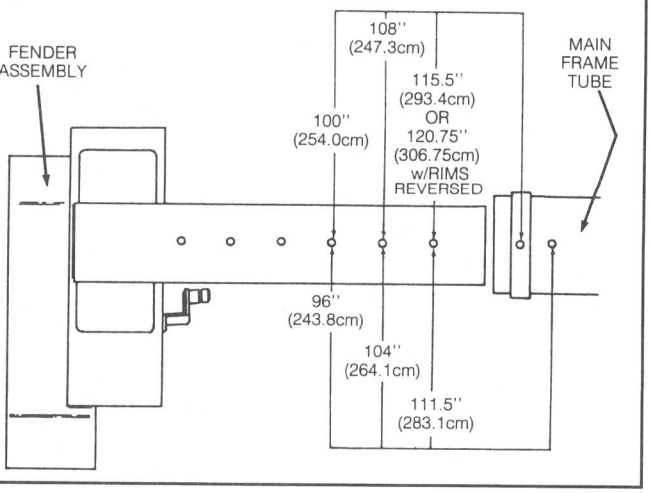
B **TREAD WIDTH - REAR WHEELS**
220-78'' with Extension Axle (Accessory)



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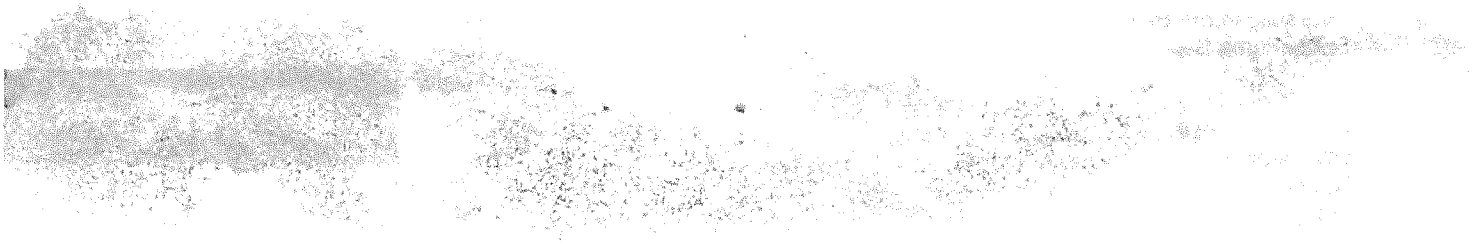


⚠ WARNING

DO NOT service the Spra-Coupe without instructions or taking the necessary safety precautions. Before working on the Spra-Coupe, see the Safety Instructions at the beginning of this Manual. After making the repair or adjustment, always check the function of the Spra-Coupe. Failure to obey warnings may cause injury or death.

PREVENTIVE MAINTENANCE SCHEDULE

ENGINE AND TRANSMISSION

ITEM	SERVICE REQUIRED	SERVICE INTERVAL							
		AFTER FIRST 10 HOURS	DAILY	EVERY 10 HOURS	SEASONAL OR EVERY 50 HOURS	EVERY 150 HOURS	EVERY 300 HOURS	EVERY 500 HOURS	EVERY 1000 HOURS
Engine Cooling System	Clean debris from cooling fins, shrouds and grills. Check for leaks - Check coolant level cold. Add 50-50 ethylene glycol-water as needed.	x		x					
Engine Oil and Filter	Check oil level and add oil as needed.	x	x						
	Change engine oil and filter. Inspect engine for leaks.					x			
Carburetor	Check and adjust. (See page 38.)	x			x				
Air Cleaner	Inspect condition indicator. If red, clean. Inspect hose connections for tightness.				x				
	Replace filter element.						x		
Spark Plugs	Replace.					x			
Battery	Check voltage level. Clean and grease battery posts.				x				
Fuel Filter	Replace.					x			
Transmission Oil	Change use SAE 90 gear oil Specification API--GL5 or MIL-L-2105B Transmission Oil.	x						x	
Transmission Oil	Check oil level.					x			
Clutch Pedal	Adjust free travel to one inch.	x			x				
Governor	Check oil level. (See "GOVERNOR LUBRICATION" page 39.)								
Governor Throttle Lever	Lubricate with NLGI No. 1 or No. 2 grade lithium base grease (one zerk per shaft).				x				
Hydraulic Oil	Check oil level.	x			x				
Hydraulic Oil and Filter	Change								x
Exhaust System and Spark Arrestor Muffler	Empty spark chamber. Check exhaust system for leaks.					x			

FINAL DRIVE

Chain Housing	**Check oil level. Add hypoid transmission lubricant SAE 90 oil as needed.**	x				x			
Constant Velocity Bearing	Pack with NLGI No. 2 lithium base grease.							x	
Adjustable Axle Telescoping Shaft	Lubricate with NLGI No. 1 or No. 2 grade lithium base grease (one zerk per shaft).			x					
Final Drive Pivot Pins	Lubricate with NLGI No. 1 or 2 grade lithium base grease (one zerk per final drive).	x		x					
Input Drive Housing	Lubricate with NLGI No. 1 or 2 grade lithium base grease (one zerk per side).				x				

FRONT SUSPENSION

Suspension Cylinder (Wide Front)	Check oil level. Fill with No. 90 EP multiviscosity oil to bottom of cylinder plug.	x			x				
Steering Plate and Spindle	Lubricate with NLGI No. 1 or No. 2 grade lithium base grease (two zerks).	x		x					
Front Wheel Bearings	Pack with NLGI No. 1 or No. 2 grade lithium base grease. Check and adjust hub bearing end play. Correct end play is 0.001" to 0.005" (0.03mm to 0.13mm).							x	

PREVENTIVE MAINTENANCE SCHEDULE

FRONT SUSPENSION (Cont'd.)

ITEM	SERVICE REQUIRED	SERVICE INTERVAL							
		AFTER FIRST 10 HOURS	DAILY	EVERY 10 HOURS	SEASONAL OR EVERY 50 HOURS	EVERY 150 HOURS	EVERY 300 HOURS	EVERY 500 HOURS	EVERY 1000 HOURS
Front Wheel Shoulder Bolts (Single Front)	Lubricate with lithium base grease (two per side)			x					
Front Wheel Fork Bushings (Single Front)	Inspect for wear (three per side)			x					
Wheel Fork Shaft (Single Front)	Lubricate with lithium base grease (one zerk)	x		x					

SPRAY SYSTEM

Spray Tank and Spray System	Flush.		x						
Pump Clutch	Check set screws.	x		x					
Booms	Check hoses and hardware. Check hose clamps. Tighten from 50 to 60 in. lbs. (5.65 to 6.78 N'm).	x		x					
Line Screens and Nozzle Screens	Check and clean.	x		x					
Spray Tank	Inspect for hairline stress cracks and leaks				x				

BELT ADJUSTMENTS

Alternator/Water Pump Belt	Tension to be set to a gauge reading of 63-94 lbs. or so that 5.9 lb. (26.24N) force produces a deflection of .18"-.25" (4.6mm-6.3mm).	x		x					
Fan/Governor Belt	Tension to be set to a gauge reading of 42-63 lbs. or so that 4.6 lbs. (20.46N) force produces a deflection of .32"-.48" (8.2mm-12.9mm).	x		x					
Spray Pump Belt	Tension to be set to a gauge reading of 60-90 lbs. or so that 6.3 lbs. (28.02N) force produces a deflection of .13"-.19" (3.4mm-4.8mm).	x		x					
Hydraulic Pump Belt	Tension to be set to a gauge reading of 60-90 lbs. or so that 6.3 lbs. (28.02N) force produces a deflection of .16"-.22" (4.0mm-5.76mm).	x		x					

GENERAL

General Visual Inspection	Check for loose or broken parts, damage to seat belt, instrument operation, etc.			x					
Cab Interior	Check and remove chemically contaminated clothing and other materials from inside the cab.		x						
Engine Compartment	Check engine compartment for debris. Clean as required.		x						
Wheel Lug Bolts	Torque to 80 ft. lbs. (108.48 N'm).	x		x					
Master Brake Cyl.	Check and fill if necessary.				x				
Brake	Inspect pads and adjust or replace if necessary				x				
Tires	Check psi. See specifications on page 85 for proper inflation.			x					
Boom Lift Cylinder (Mounting Pin-Base End)	Lubricate with grade NLGI No. 1 or No. 2 lithium base grease. (one zerk)				x				
Boom Fold Cylinder Pivots and Pins	Lubricate with grade NLGI No. 1 or No. 2 lithium base grease. (one zerk)		x						
Inner Boom Hinges (upper & lower)	Lubricate with NLGI No. 1 or No. 2 grade lithium base grease. (two zerks per side)		x						
Electrical Wiring	Check for bare wires, etc. Check instrument operation.	x		x					
Controls and Cables	Check operation and adjust or replace if needed.				x				
Seat Belt	Check condition and mounts		x						
Safety Signs	Check condition. Must be clean and legible		x						
Tow Hitch	Inspect for damage or cracked welds. Replace if required.		x						

⚠ WARNING

AVOID INJURY OF DEATH

- **Read and follow all instructions and warnings before doing service work.**
- **Check all functions after making repairs or adjustments to assure proper operation.**

Engine Access

The left and right engine covers **[A]** are removable for access when servicing the engine or spray system within the engine compartment.

⚠ WARNING

AVOID INJURY OR DEATH

Do not remove engine covers or service engine is running unless instructed.

Fuel

The fuel tank is located in the nose cone in front of the operator cab. To add fuel, remove cover. When filling from cans, use a fine mesh strainer or filter cloth to keep from getting dirt or debris into the tank.

Use leaded or unleaded regular fuel not lower than 87 octane rating.

If regular fuel with adequate anti-knock properties is not available, use premium (leaded or lead-free) or a mixture.

☛NOTE: The engine can be run on premium fuel with no problems.

Fuel Additives

On **carburetor engines** carburetor icing can occur at ambient temperatures between 0°C and + 15°C when the air humidity is high despite the automatically controlled intake air preheating. This can cause the engines to stall occasionally when idling in the warm-up phase.

Even the anti-icing additives contained in some fuels in the cold season cannot entirely prevent carburetor icing. When a properly tuned engine stalls repeatedly in the conditions described above, add deicer gas treatment (with isopropyl) to the fuel tank.

Checking the Engine Oil Level

The oil can only be checked accurately when the machine is level. Do not check the oil immediately after stopping the engine as the oil in circulation takes a few minutes to drain down into the sump.

Pull the dipstick out and wipe it with a clean cloth. Push the dipstick in fully, pull it out again and check the level **[B].**

The oil should be between the two marks on the dipstick but never below the "min." mark. If the engine is to be run continuously for long periods (10-12 hours), the oil level should **be at least** in the middle between the two marks before starting.

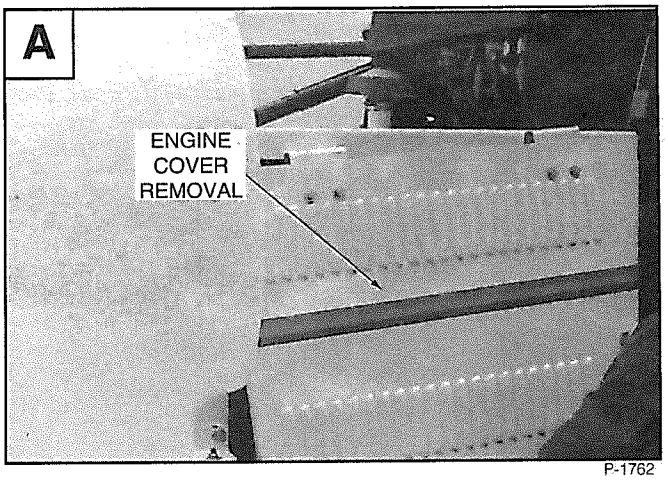
The difference in oil quantity between the "max." and "min." marks is 1.0 litre.

Topping Up Engine Oil

Remove the cap in the cylinder head cover and add oil **[C].**

Check level with dipstick.

The oil should not be above the "max." mark.



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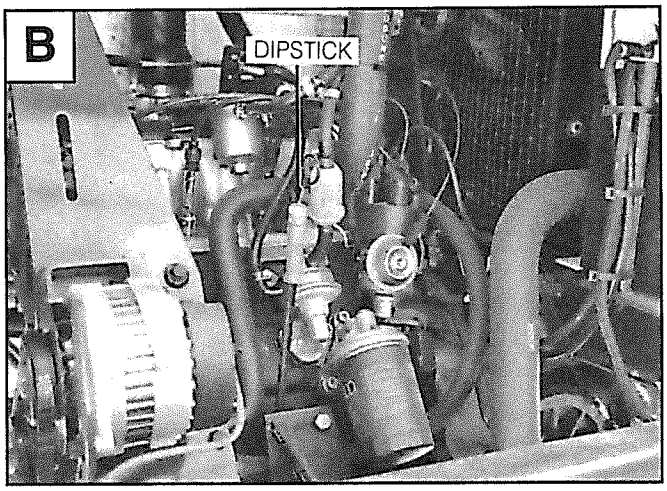

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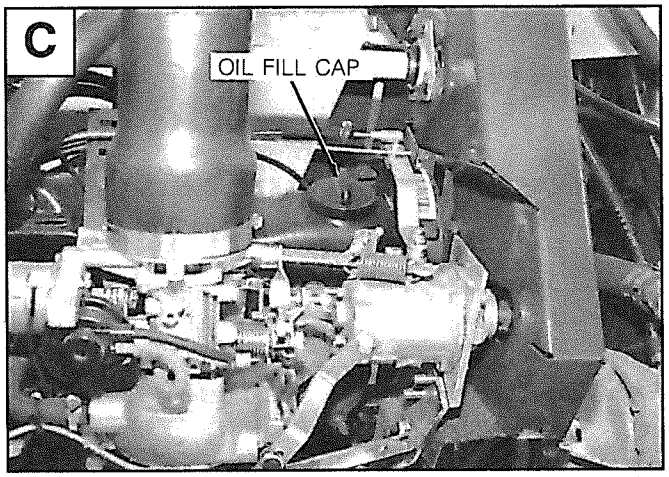

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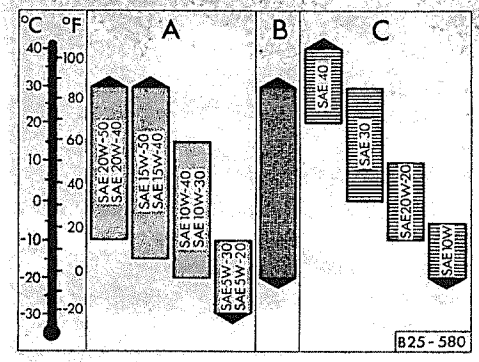
ENGINE (Cont.d)

Engine Oil

Engine oil tends to thicken at low temperatures and may cause starting difficulties. As soon as winter temperatures are expected, change over to a thinner grade of oil. If you use multigrade oil, you should not normally need to change to a different grade. At high temperatures, an engine oil with a higher viscosity must be used. See the following for further details.



Oil Specification

A—Multigrade oils, specification VW 501 01
—Multigrade branded oils, specification API-SF[1])
B—Improved lubricity oils, specification VW 500 00
—High performance oils, specification VW 500 00 **and** 505 00
C—Single grade branded oils, specification API-SF[1])

1)These oils may only be used if the approved engine oils are not available.

The specifications must be marked on the container.

When topping-up, the oils can be mixed with one another.

The **viscosity class** of the oil must be selected as indicated above. The oil does not have to be changed when the ambient temperature is briefly above the range shown.

When using SAE 10 W single grade oil, do not run at high engine speeds and/or full load for long periods.

If the engine is running continuously in very dusty conditions, the engine oil should be changed at shorter intervals.

Changing Engine Oil and Filter

See **"PREVENTIVE MAINTENANCE SCHEDULE"** on page 31 for the service interval for replacing the engine oil and filter.

1. Start engine and warm to operating temperature. Stop the engine.
2. Remove the drain plug **[A]** and drain oil into a container.
3. Remove the oil filter **[B]**.
4. Clean the filter housing surface. Apply clean oil on the sealing ring of the new filter and install filter. Hand tighten only.
5. Install and tighten drain plug but do not over tighten.
6. Remove cap in the cylinder head cover and put in 3.2 quarts (3.0 liters) of oil in the engine. (See oil chart above.) (Engine oil capacity without oil filter change is 2.6 quarts (2.5 liters.)
7. Start the engine and let it run for several minutes. Stop the engine and check for leaks. Check the oil level. Add oil as needed until correct level is indicated on the dipstick.

⚠ WARNING

Always clean up spilled fuel or oil. Keep heat, flames, sparks or lighted tobacco away from fuel and oil. Failure to use care around combustibles can cause explosion or fire which can result in injury or death.

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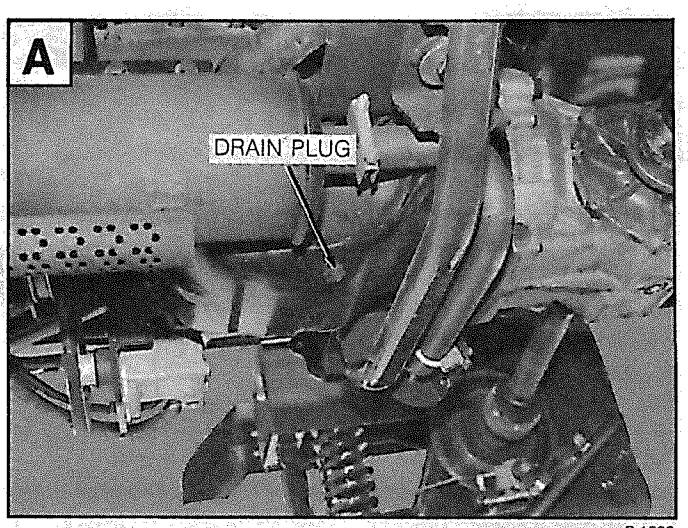

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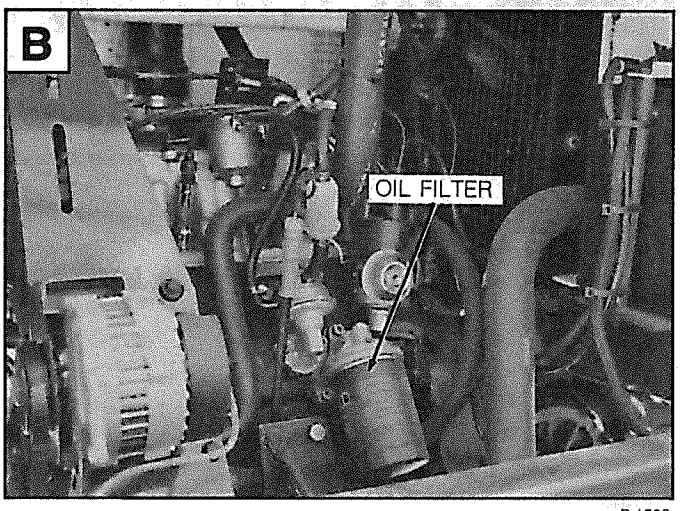

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ENGINE (Cont'd.)

Spark Plugs

The following plugs are used:

Bosch	W 7 DTC
Beru	14-7 DTU
Champion	N 7 BYC

Electrode gap 0.6...0.7 mm

The appearance of a plug which has been removed from engine indicates the following conditions:

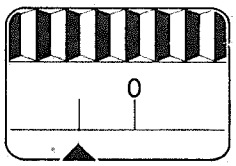
1. Light to white colored
   - Plug and engine settings in order.

2. Velvet black
   - Heat value too high
   - Gap too large
   - Mixture too rich
   - Insufficient air (air cleaner dirty)
   - Engine not reaching correct operating temperature

3. Glistening with oil
   - Plug misfiring
   - Too much oil in combustion chamber
   - Cylinders and rings worn.

4. Pearl formation
   - Plug heat value too low
   - Plug loose
   - Mixture too weak
   - Valves not sealing properly

Ignition Timing



The contactless TCI-H ignition system must be checked dynamically with a stroboscope or an ignition timing tester at idling speed (800 rpm) and adjusted as required.

Adjusting conditions:

1. Minimum engine oil temperature 30 °C.

2. Stroboscope or tester connected in accordance with operating instructions.

3. Vacuum hose pulled off.

4. Start engine and run it at an idling speed of 800 rpm.

5. Check ignition timing. Ignition notch on flywheel must be aligned with reference mark.

6. If adjustment is required, loosen distributor clamping screw until distributor can just be turned by hand.

7. After making adjustment, tighten distributor clamping screw. Reinstall vacuum hose.

8. Stop engine first and then disconnect stroboscope or tester.

ENGINE (Cont'd.)

Air Cleaner

A properly maintained air inlet system is necessary for long engine life. A small leak in the system can destroy an engine in a few minutes. The Spra-Coupe air cleaner is equipped with a vacuator valve, which will automatically eject moisture and dust. (See **"PREVENTIVE MAINTENANCE SCHEDULE"** on page 31 for service requirements.)

To service the filter, follow these steps:

☛Note: Remove the filter cartridge (element) only when the red ring appears in the sight window of the condition indicator [A].

1. To change the filter cartridge, loosen clamp **[A]** (Item 1) and remove end cup (Item 2). Loosen and remove filter wing nut retainer and rubber washer (inside the air cleaner tank) and remove filter cartridge.

2. Before installing the new cartridge, wipe all foreign material from the filter container.

3. Install the clean cartridge carefully to insure proper sealing. Be sure that the cartridge gasket is in good condition and the new rubber washer is properly installed under the wing nut.

4. Replace end cup (Item 2) onto the tank and secure clamp (Item 1).

5. Press the reset button on the condition indicator to retract the red ring from the sight window.

Air cleaners should be inspected daily for leaks or dents. A damaged air cleaner can destroy your engine.

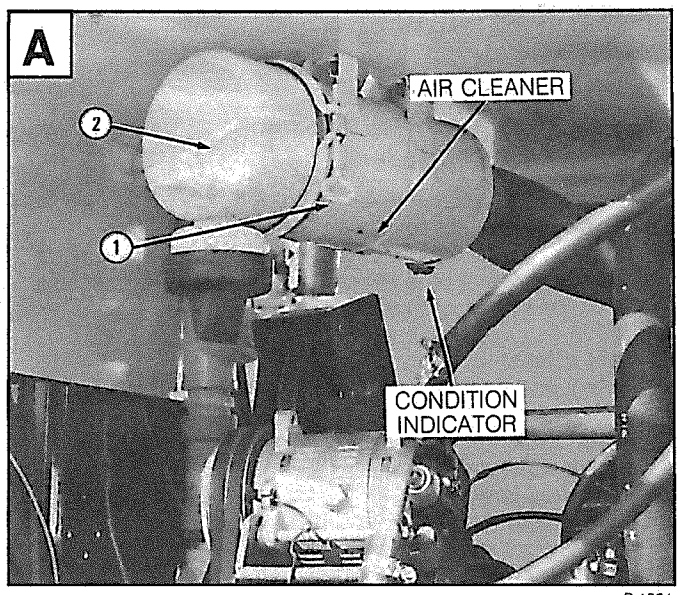
The following air cleaner service precautions should be taken when the engine is being serviced in the field.

1. Check all connections for tightness, make certain that the air cleaner outlet pipe and air inlet are tight.

2. If the air cleaner has been dented or damaged, check all connections immediately. Check the internal cartridge sealing areas and replace the air cleaner tank if necessary.

3. In case of leakage, if adjustment does not correct the trouble, replace the damaged parts.

4. Examine the carburetor cross-shafts for looseness, which will allow unfiltered air to enter the engine.



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ENGINE (Cont'd.)

Engine Cooling System

The Spra-Coupe is equipped with a coolant recovery system. The coolant expands with rising temperature, and the overflow is collected in the recovery tank **[A].** When the system temperature drops, the coolant is drawn back into the radiator.

The cooling system has been filled at the factory with a high quality, inhibited, year-around coolant. This coolant solution provides freezing protection to -34°F (-36°C).

The coolant solution must be used year round to:

a). Maintain cooling system freeze protection at -20°F (-29°C) or -34°F (-36°C) in Canada.
b). Protect against rust and corrosion in the cooling system.
c). Provide proper engine temperature for efficient operation.
d). Provide proper operation of coolant temperature gauge.

Coolant System Care

Check the cooling system at regular intervals, such as during fuel stops. You usually do not need to remove the radiator cap to check the coolant level. Remove right engine cover and look at the "see through" coolant recovery tank **[A].** Level should be at the "full cold" mark on the recovery tank when the system is cold, and at the "full hot" mark at normal operating temperature. When topping up coolant, do not remove the cap on the recovery tank when engine is hot. Stop engine and let it cool down slightly. Then cover recovery tank cap with a cloth and turn cap off slowly, letting pressure escape first. Then take cap off. In order to maintain the corrosion protection at all times and prevent the system from becoming scaled up, **the mixture should not be weakened by adding plain water even in the summer.** To top coolant, add a 50/50 mixture of high-quality ethylene glycol antifreeze and water to the recovery tank for coolant additions. Add cold coolant only when engine is **cold** to avoid damaging the engine. Screw cap on again tightly.

Coolant loss hardly ever occurs in the closed cooling system so that topping up is not normally necessary. A noticeable loss of coolant usually indicates leakage somewhere. If frequent additions are required, see your dealer for a cooling system check.

The cooling system should be serviced each year as follows:

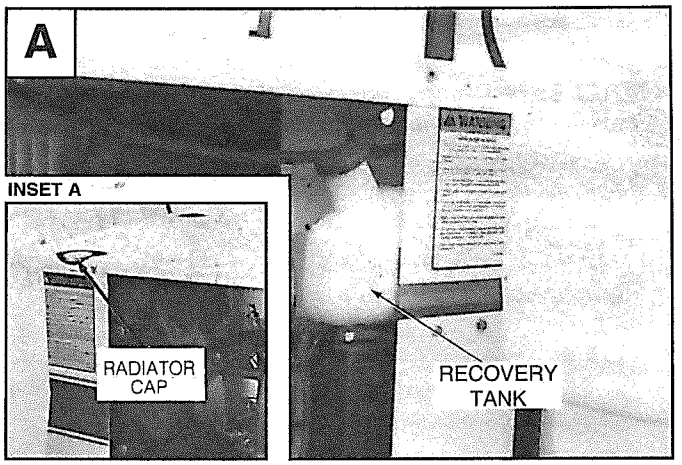
1. Wash radiator cap and filler neck with clean water.
2. Check coolant for proper level and freeze protection.
3. Test system and radiator cap for proper pressure holding capacity (14 psi).
4. Tighten hose clamps and inspect all hoses. Replace hoses if swollen, checked or other wise deteriorated.
5. Clean frontal area of radiator core.

Radiator Pressure Cap

The radiator cap [A] (Inset A), a 14 lb. pressure type, must be installed tightly, otherwise coolant may be lost and damage to engine may result from overheating. Radiator pressure caps should be checked periodically for proper operation.

When necessary to remove the radiator cap, do so when the engine and radiator is cool.

a). Rotate cap slowly counterclockwise to detent (Do not press down while rotating).
b). Wait until any residual pressure (indicated by a hissing sound) is relieved, then press down on cap and continue to rotate counterclockwise.



P-1763
P-1119

⚠ WARNING

Do not remove radiator cap while engine and radiator are still hot. You can be seriously burned.

Flushing the Cooling System

To flush the system:

1. Remove radiator cap **[A]** (Inset A) when engine is cool.
2. Run engine with radiator cap removed, until upper radiator hose is hot (indicates thermostat is open).
3. Stop engine and open radiator drain valve to drain coolant. Loosen and remove the lower radiator hose to drain coolant from the engine.
4. Close valve and reconnect the lower radiator hose. Add sufficient water to fill system.
5. Repeat steps 1, 2, 3, and 4, a sufficient number of times until the drained liquid is nearly colorless.
6. Allow system to drain completely then close radiator drain valve tightly and reconnect the lower radiator hose.
7. Remove the cap from the recovery tank [A] leaving hoses in place. Remove coolant recovery tank, empty fluid, scrub and clean bottom and sides of tank with detergent and water, flush well with clean water, drain, and reinstall.
8. Add sufficient ethylene glycol coolant to provide the required freezing and corrosion protection - at least a 50 percent solution (-34°F - 36°C). Fill radiator to the base of the radiator filler neck and bring level of coolant in the recovery tank to the "FULL HOT" mark. Reinstall recovery tank cap.
9. Run engine, with radiator cap removed, until radiator upper hose becomes hot.
10. With engine idling, add coolant to radiator until level reaches bottom of filler neck and install cap.

Adjusting The Governor

☛NOTE: Be certain the engine is properly tuned and the air cleaner cleaned prior to governor adjustment.

High RPM Adjustment

1. Park the Spra-Coupe on a level surface. Engage the hand brake and place the transmission in the neutral position.
2. With engine off, pull the throttle lever **[A]** forward until the governor spring is slightly stretched.

   Adjust the length of the throttle rod **[B]** to provide 3/8" (9.525mm) gap between the bottom edge of the carburetor lever and the center of the wide open stop pin on the carburetor as indicated.
3. Place the transmission in neutral and engage the hand brake.
4. Start the engine and allow it to warm up to operating temperature. Check that the automatic choke has released.
5. Move the hand throttle fully forward against the stop and check engine RPM. Adjust the length of the hand throttle cable (at the governor arm) until 3800 RPM is obtained.

   Lengthen cable to decrease engine speed. Shorten cable to increase engine speed.

   Return hand throttle to "idle" position.
6. Check and adjust the foot throttle for correct engine speed of 3800-3900 RPM. This is done by lengthening or shortening the foot throttle cable at the foot pedal (accessible from under machine) until correct engine speed is obtained when pedal is fully depressed to the floorboard.

   Lengthen cable to decrease engine speed. Shorten cable to increase engine speed.

Idle Adjustment

1. Return the throttle lever to the "idle" position. Be certain the hand throttle is in the maximum "SLOW" position.
2. Check if the carburetor arm **[B]** rests on the idle stop pin. If it does, continue to step 3. If it does not:
   a). Recheck that the automatic choke has released.
   b). Readjust the throttle rod as required then recheck the high RPM (3800). Readjust using step 1 of the **"HIGH RPM ADJUSTMENT"** procedure.
3. With the carburetor arm against the idle stop pin, adjust the low idle screw **[B]** (Inset A) inward to decrease the idle speed or outward to increase the idle speed until 800 RPM is obtained.
4. Check and/or adjust governor sensitivity as follows:
   a). From idle speed, quickly accelerate engine. With properly adjusted governor, the engine RPM will surge one or two times then level out. Engine RPM surging more than twice indicates that the governor is over sensitive. Engine RPM not surging at all, indicates inadequate governor sensitivity. Adjust the governor sensitivity as required using the eye bolt **[A].** Lengthening the eye bolt will decrease sensitivity, shortening the eye bolt will increase sensitivity.

   If after adjusting, leveling out of the engine is unattainable, it may be necessary to adjust the surge screw **[A].** Turn into governor housing, rechecking engine operation at high RPM after each small surge screw adjustment, until operation is correct.

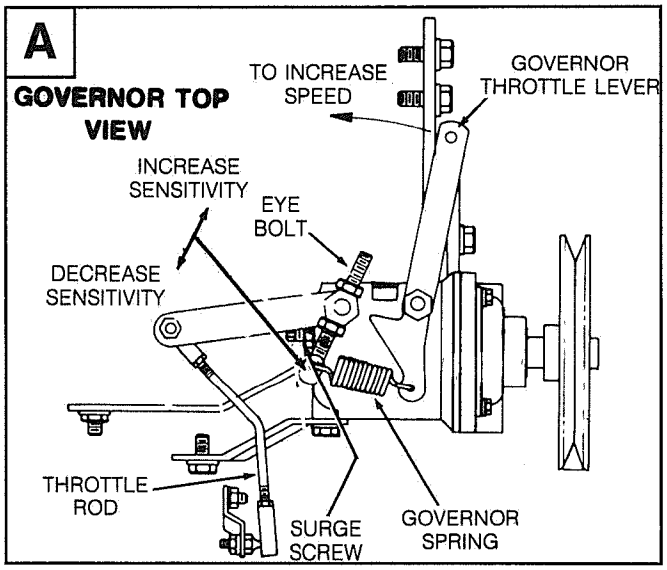
☛NOTE: Do not turn the screw inward to the point that the No-load speed of the engine increases.

⚠ WARNING

AVOID INJURY OR DEATH

Do not use the Spra-Coupe in area with explosive dusts or gases, or with flammable material near the exhaust.

Keep body, loose objects and clothing away from electrical contacts, moving parts, hot parts, and exhaust.



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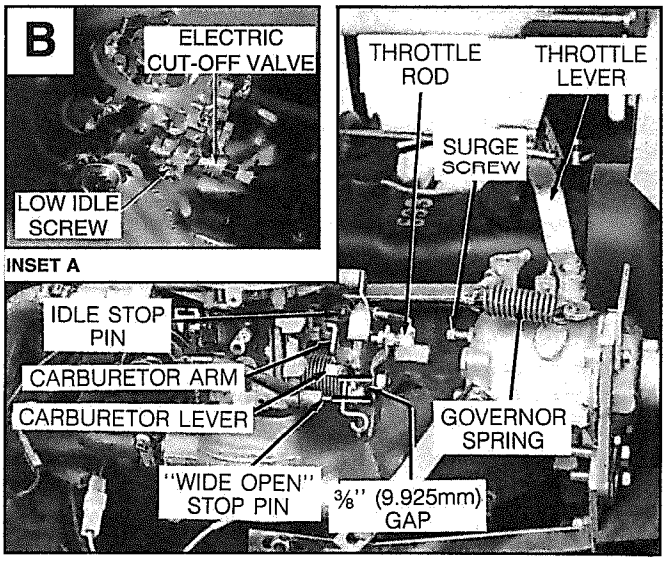


P-1194
P-1121

ENGINE (Cont'd.)

Hand Throttle Adjustment

The hand throttle spring tension can be adjusted for light to heavy lever operation depending on the Operator's preference.

To adjust, remove the side cover **[A].** Loosen jam nut (Inset A) then tighten or loosen the tension adjust nut until the desired throttle operating tension is obtained. Secure jam nut and reinstall cover.

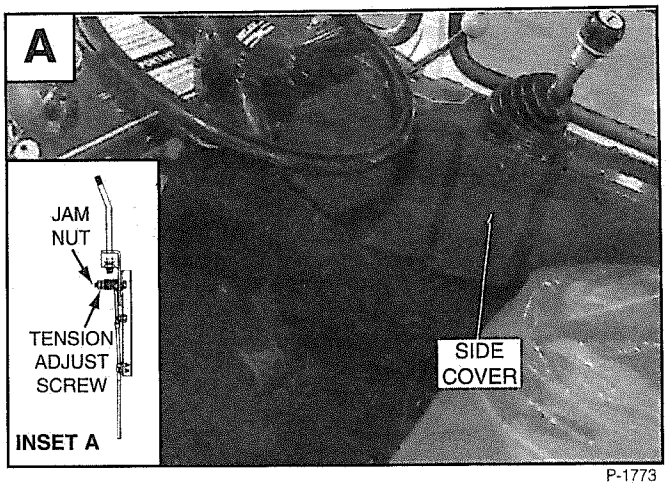
Governor Lubrication

The governor **[B]** is factory oil pre-filled.

At the end of every 1,000 hours of operation or one year, drain oil from governor and refill with 2.75 to 3.0 ounces of 20W engine crankcase oil.

If the governor appears to be leaking oil, the oil must be drained and the governor refilled with the correct amount of oil. If leakage continues, repair as required.

To drain and refill, the governor will need to be removed from the engine. When governor is reinstalled, readjust governor belt tension and readjust to obtain a 3/8" (9.525mm) gap between the carburetor lever and wide open stop pin on the carburetor. See **"BELT ADJUSTMENTS"** section on page 58 and **"ADJUSTING THE GOVERNOR"** section on page 40.



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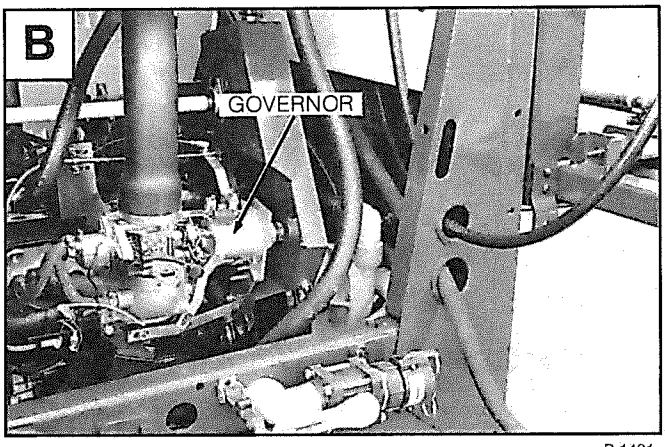


P-1481

Shift Lever Adjustment

The shift lever cable length is correctly adjusted when:

a). The shift lever slides along the reverse stop when shifting into 1st and 2nd gear.

b). The shift lever is perpendicular (at 90°) to the top side of the console when in the "neutral" position.

To Adjust:

1. Remove nut from bolt **[A]** (Item 1) and detach the cable from bracket.
2. Position bracket **[A]** (Item 3) in the "neutral" position between 1st and 2nd gear.
3. Pull end of cable **[A]** (Item 2) outward until shift lever in the cab contacts the stop. At this point, the bolt through the end of the cable (Item 1) should line up with the hole in the bracket (Item 3).

If alignment is off center, loosen jam nut (Item 4) and turn end of cable to lengthen or shorten cable as required, then secure jam nut.

☛ **NOTE: If cable end runs out of adjustment before correct alignment is obtained, readjustment at the shift lever end of the cable will be required.**

4. Reinstall cable onto bracket using bolt and nut **[A]** (Item 1), then tighten.
5. Disconnect cable **[A]** (Item 5) from bracket.
6. With the shift lever in the "neutral position," loosen jam nut **[A]** (Item 6) and turn end of cable in or out until shift lever is perpendicular (at 90°) to the top side of the shift console.
7. Tighten jam nut **[A]** (Item 6), then reinstall cable onto bracket and secure with hex nut.

Adjusting Clutch Pedal

The clutch pedal **[B]** should have approximately 1 in. (25.4mm) free travel before the clutch begins to disengage. If this distance is excessively greater or less than 1 in. (25.4mm), adjust length of the clutch cable until the recommended free travel distance is obtained.

Final Drive and Axle Lubrication

Periodically check the drive chain lubricant level in the lower chain housing. To do this, remove the fill plug **[C]** (Item 1). If lubricant is low, fill with Hypoid Transmission Lubricant SAE 90, to within 1/2" (12.7mm) from the bottom of the fill plug hole.

To drain the oil from the final drive housing, remove the drain plug in the lower end of the housing.

Refer to the **"PREVENTIVE MAINTENANCE SCHEDULE"** on page 31 for proper lubrication of the velocity joints **[C]** (Item 2) and telescoping upper axle (Item 3).

Transmission Lubricant

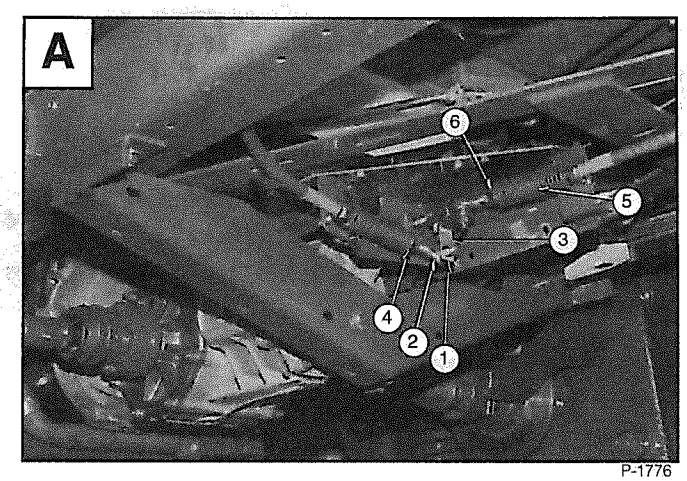
The transmission uses hypoid SAE 90 gear oil. The oil capacity of the transmission is 5.3 pints (2.5 liters).

Check the oil level and change oil as recommended in the **"PREVENTIVE MAINTENANCE SCHEDULE"** on page 31.

The fill plug and drain plug can be removed using a 17mm hex head wrench.

To check or top up oil level, remove the oil fill plug **[D]** on the left side of the transmission case. The oil level is to be maintained to the bottom of fill hole. Turn plug back into the transmission case and tighten.

To change transmission oil, remove the drain plug **[D]** in the bottom of the transmission case. Clean the drain plug before replacement and tighten.



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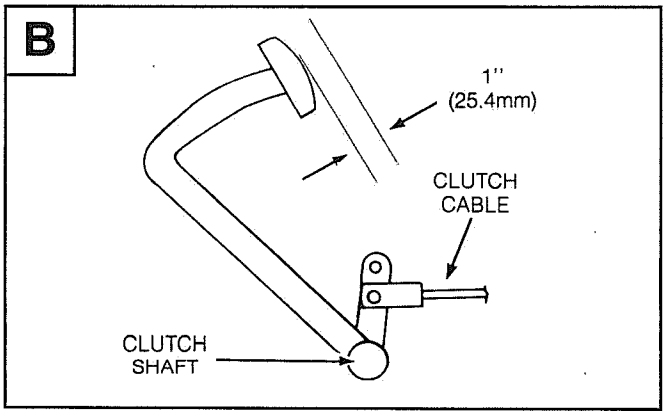

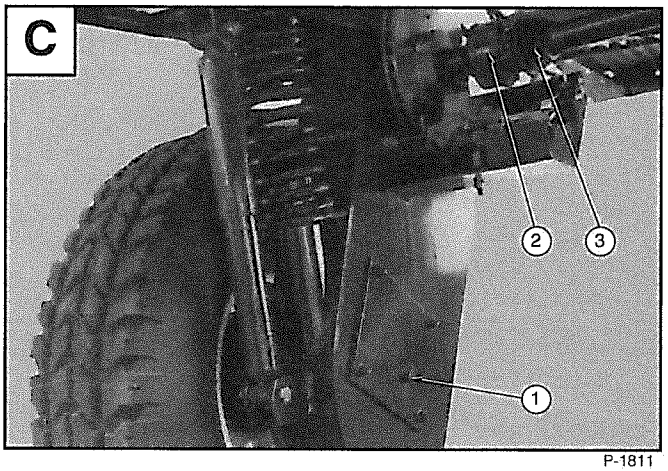

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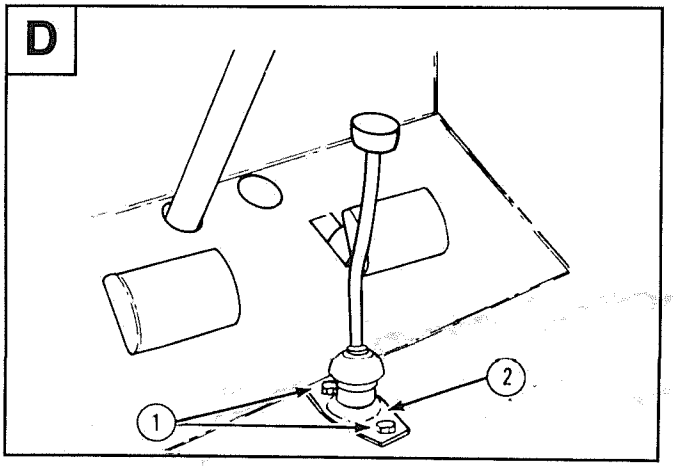


P-1584

BRAKES

Bleeding the Brake Hydraulic System

a). Check the fluid level in the master cylinder reservoir. Fill if necessary.

☛NOTE: Check and fill master cylinder frequently during and at the completion of these procedures:

b). Pump the brake pedal several times and hold.

c). Loosen the bleed screw **[A]**. Slowly depress the brake pedal to the floorboard and hold. Tighten the bleeder screw and release pedal. Repeat until clear fluid (free of bubbles) flows from the brake housing.

d). Final, check that the brake feels solid (not spongy) when pedal is depressed.

☛NOTE: Failure to remove all air from the brake line will cause poor brake response and premature puck wear.

⚠ WARNING

AVOID INJURY OR DEATH

Park the Spra-Coupe on a level surface, place the transmission in first gear and block the front and rear of the tires before servicing the brakes.

Brake Adjustment

1. Disconnect the hand brake cables from the actuating lever **[C]**.
2. Loosen the jam nuts on the yokes **[A]**.
3. Screw the yokes **[A]** into the brake housings until tight.
4. Back yokes out no less than 1/2 turn and no more than 1 1/2 turns to the correct actuating lever position.
5. Tighten the yoke jam nut to 100 ft-lbs.
6. Reattach the hand brake cables to the brake actuating levers as was originally **[A] [C]**.
7. Adjust the hand brake lever knob **[C]** to obtain 1" (25.4mm) clearance inside the lever as indicated in figure **[C]**.
8. Operate the hand brake lever. Check that the equalizer bar is perpendicular to the clevis **[B]**.

   If adjustment is required, adjust the brake cable hex nuts on the left and right hand brake cables **[C]** until the equalizer bar is perpendicular to the clevis when the hand brake is operated.
9. Fully apply then release the hand brake to position the brake linings against the brake rotor **[A]**.

   Adjust the front and rear brake cable hex nuts (as required) evenly until .02" to .04" (0.51mm to 1.02mm) of clearance is obtained between the actuating lever and push pin **[C]** on both brakes. Tighten brake cable hex nuts.

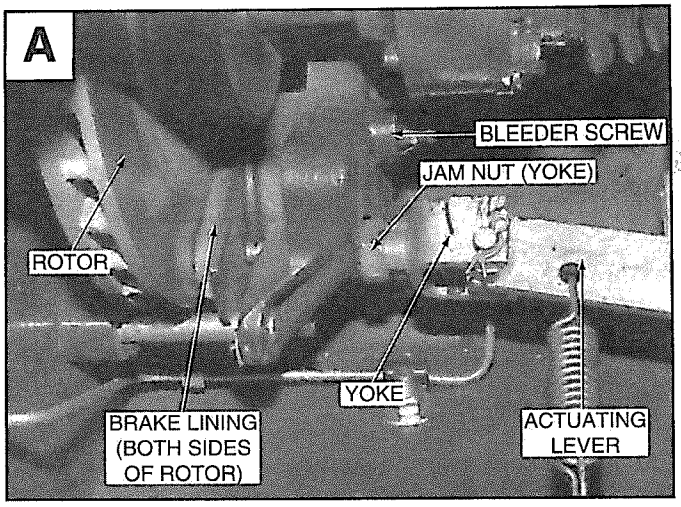
   To maintain the min. .02" to max. .04" (.51mm to 1.02mm) clearance between the end of the actuating lever and push pin, fine adjustments can be accomplished by turning the adjustment knob at the top of the hand brake lever clockwise (to tighten) the brake cable **[C]**.

   When the max. 0.04" (1.02mm) clearance has been reached, repeat steps 1 through 9 to retain correct hand brake lever and brake operation.

⚠ WARNING

AVOID INJURY OR DEATH

Check brake adjustment and operation after servicing.



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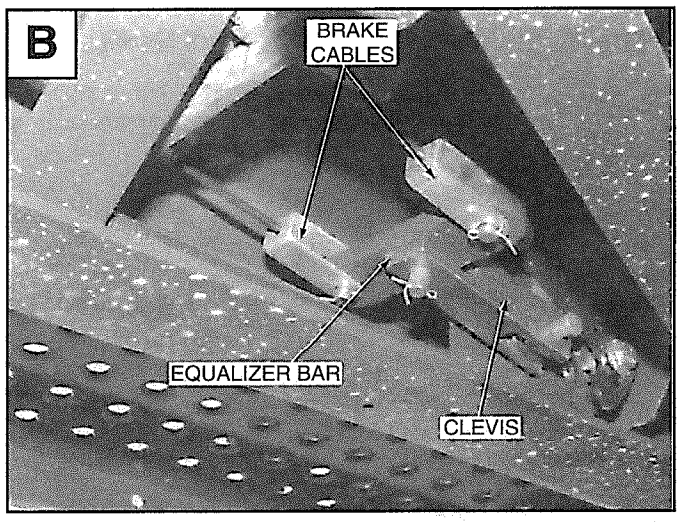

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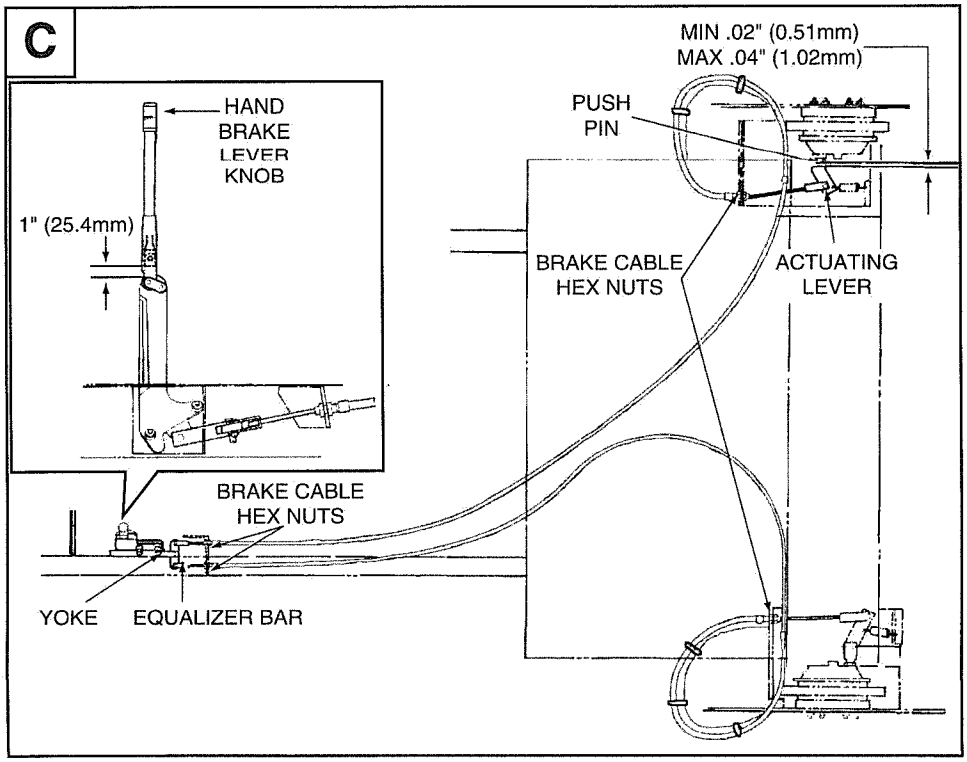


Servicing The Hydraulic System

Check the hydraulic oil level and change oil and filter as recommended in the **"PREVENTIVE MAINTENANCE SCHEDULE"** section on page 31.

To check oil level:

a). Rotate dipstick counterclockwise to decompress rubber plug then remove the cap/dipstick from the hydraulic oil reservoir tank **[A]**.

b). Wipe dipstick clean and fully reinstall.

c). Remove cap and look at the oil level on the dipstick.

d). Add recommended oil (see below) as required until oil level is within the "full" range on the dipstick.

To change oil and filter:

☛NOTE: The hydraulic oil should be cool before draining.

a). Disconnect hose **[B]** (Item 1) and drain oil into a container. Reinstall hose onto the pump when the hydraulic oil reservoir is drained and tighten.

b). Remove filter **[A]** and discard.

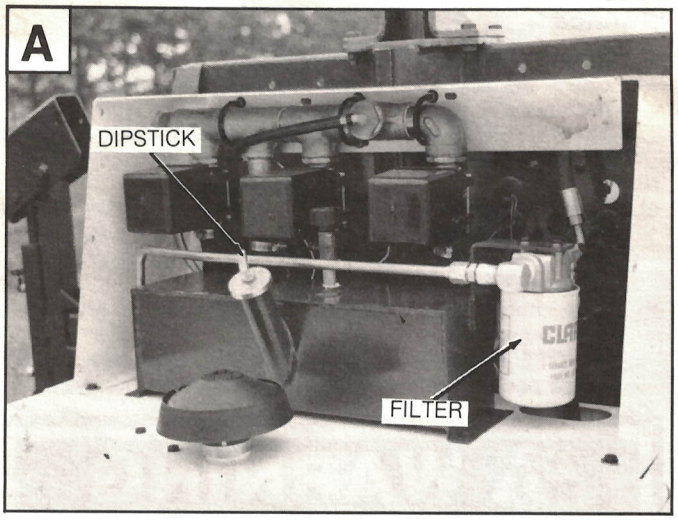
c). Install replacement Melroe oil filter.

d). Add recommended oil (see below) to the tank **[A]** to the "full" mark on the dipstick.

e). Start engine to circulate the hydraulic oil.

f). Turn engine off and check oil level in the tank **[A]**. Add oil as required until oil level is within the "full" range on the dipstick.

Recommended Hydraulic Oil
Clark Fluid (P/N 6563328). If fluid is not available use 10W-30 or 10W-40 Class SE Motor Oil for temperatures above 0 °F (– 18 °C).



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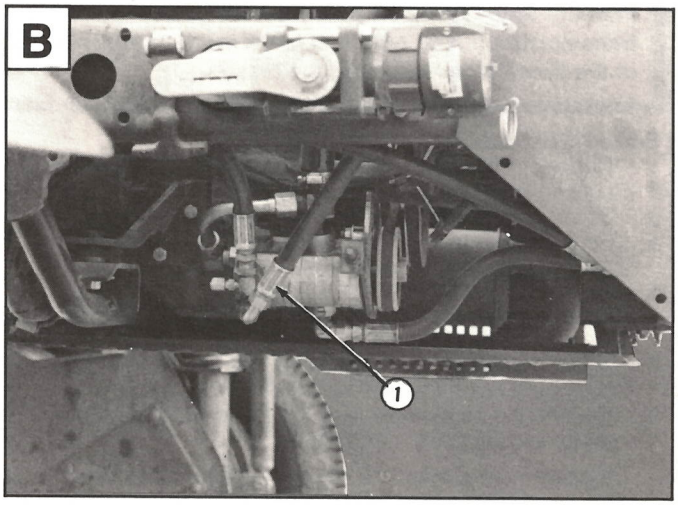

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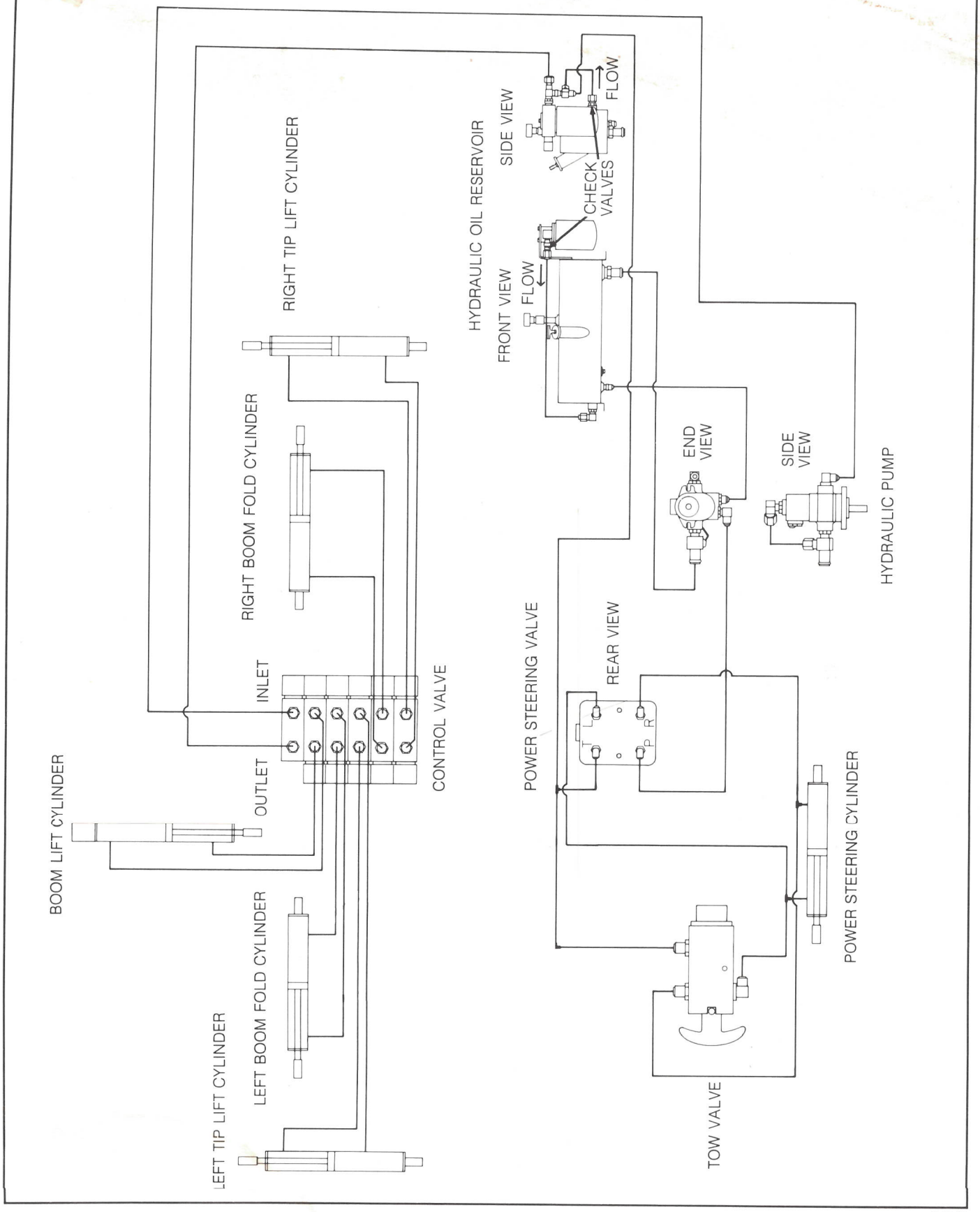
C

Hydraulic System Diagram

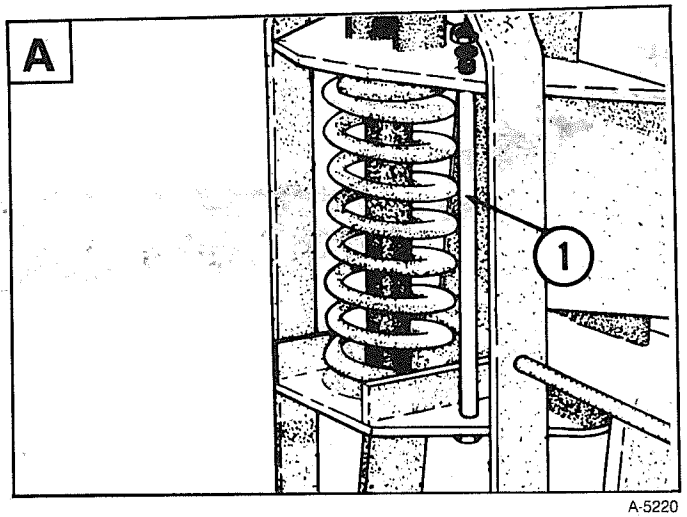


D-5245

Changing The Front Tire (Single Front)

Shift the transmission to first gear and lock the Parking Brake.

1. With normal weight on front tire, compress the front spring about 2"-3" (5.08-7.62cm) by installing two ½" x 14" bolts **[A]** (Item 1) (supplied in a bag of loose parts in the Spra-Coupe) through the holes in the front fork assembly as shown. Tighten nuts until compression is reached.
2. Raise the front end of the Spra-Coupe until most of the weight is off the front tire.
3. Remove the locking washers and nuts **[B]** (Item 1). Remove cotter pins and nuts (Item 4).
4. Remove the front shoulder bolts **[B]** (Item 2). Handle the felt seals carefully.
5. Remove the large shoulder bolts **[B]** (Item 3), again, handle the felt seals carefully.
6. Roll the front tire assembly forward out of the fork.
7. Change or repair tire as required.
8. Roll the front tire assembly back under the fork.
9. Install the rear (Hex) shoulder bolts first **[B]** (Item 3), locating the felt seals as shown.
10. Raise or lower the Spra-Coupe until the front shoulder bolts **[B]** (Item 2) and seals can be installed.
11. Install the locking washers and nuts **[B]** (Item 1). After the nuts are tightened, use a chisel to bend the washers up locking the nuts. Install cotter pins.
12. Completely lower the Spra-Coupe and remove the compression bolts **[A]** (Item 1).



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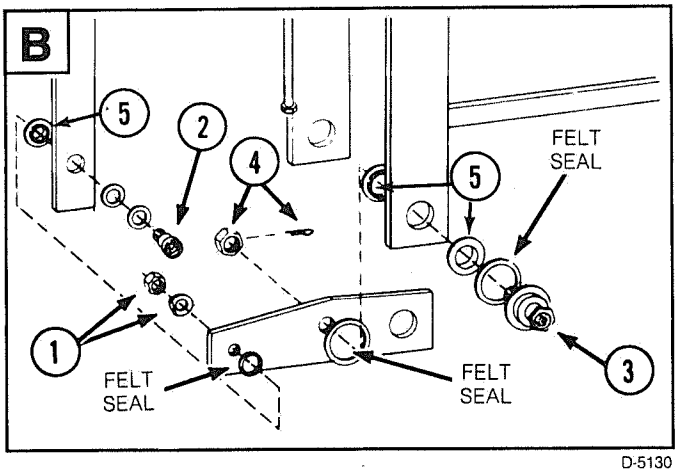


D-5130

Front Wheel Fork Bushings (Single Front)

Lubricate the front shoulder bolts **[B]** (Items 2 & 3) (grease zerk) every 10 hours. See **"PREVENTIVE MAINTENANCE SCHEDULE"** on page 32.

Inspect the front wheel fork bushings (three per side) **[B]** (Item 5) for wear every 100 hours of operation. Replace if worn.

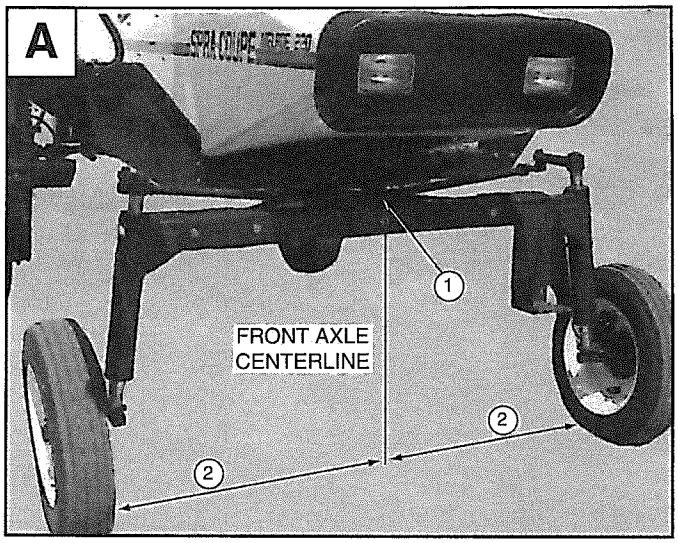
Refer to **"CHANGING THE FRONT TIRE"** section above for wheel fork disassembling and assembling procedures.

Front Suspension Oil Level (Wide Front)

The oil level in the front suspension cylinder is to be maintained to the bottom of the oil fill hole **[A]**.

To check or add oil, remove oil fill plug on the side of the suspension cylinder **[A]**. Use No. 90 multi-viscosity oil as needed.

See **"PREVENTIVE MAINTENANCE SCHEDULE"** on page 31 for additional maintenance requirements.



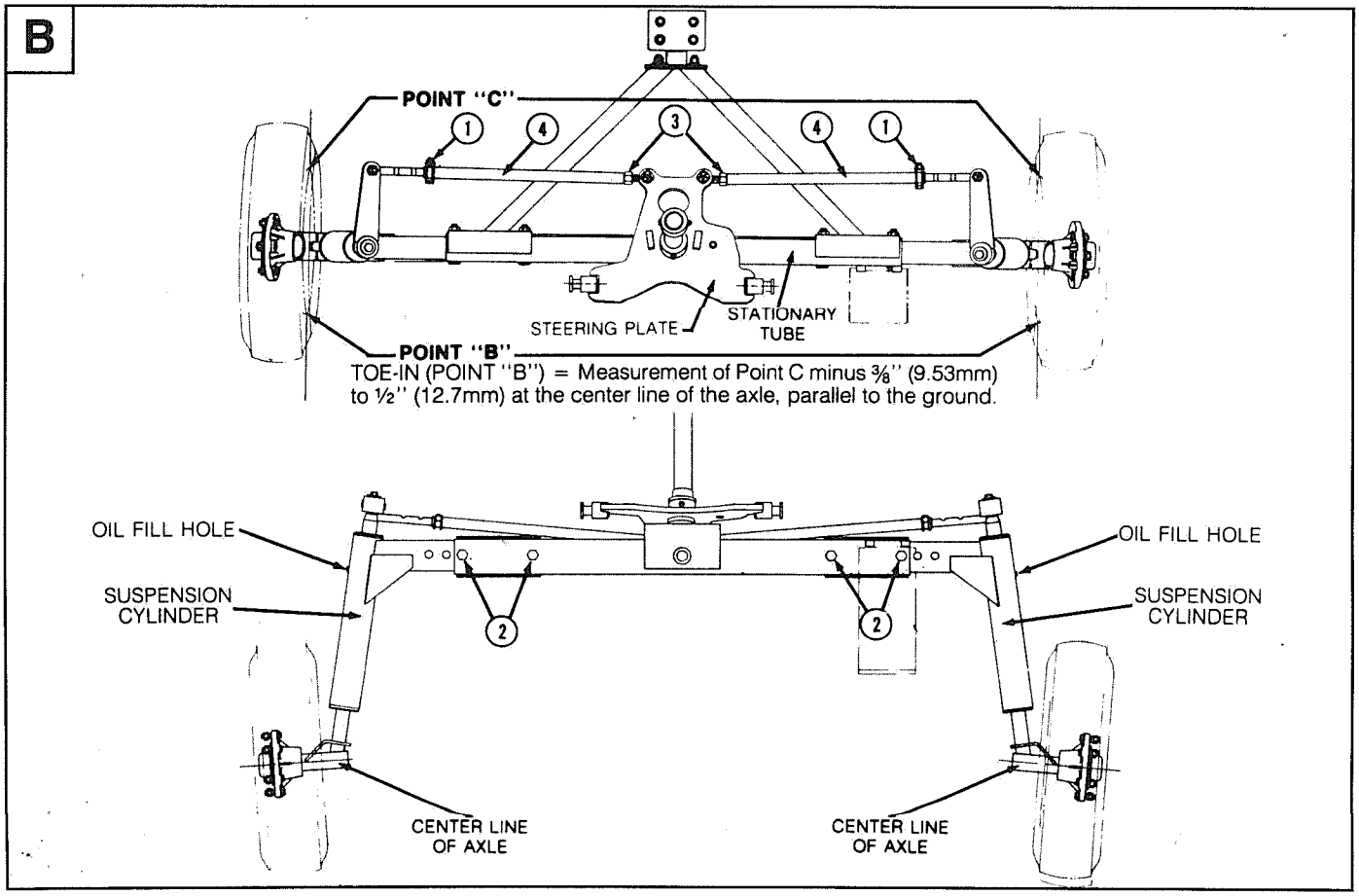
P-1810

Wide Front Toe-In Adjustment

1. Put the tires in a straight forward position.
2. Measure at the center line of the axle, from the center line of the tire, front and rear **[B]**.

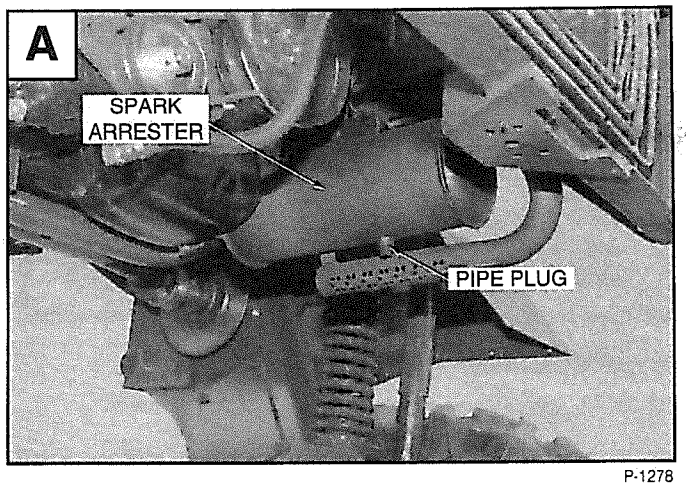
☛ **NOTE: For accurate results, make sure the steering plate (Item 1) is parallel to the main frame [A].**

3. Measure from the centerline of the front axle and adjust the tie-rods so there is equal length (Item 2) between the centerline of the front axle **[A]**.
4. Loosen the clamp **[B]** (Item 1) and jam nut (Item 3) .
5. Turn the outer tube of the tie-rod assembly (Item 4) until 3/8" to 1/2" (9.5mm to 12.7mm) of toe-in is obtained.
6. Secure the tie-rod clamp and jam nuts.



CLEANING THE SPARK ARRESTER

The spark arrester **[A]** must be cleaned after every 150 hours of use.



P-1278

⚠ WARNING

Stop engine and allow the muffler to cool before cleaning the spark chamber. Wear safety goggles. Failure to obey can cause serious injury.

W-2011

To clean:

a). Allow the spark arrester to cool if hot.

b). Remove the pipe plug **[A]** to drain the spark trap.

A slight tap on the spark arrester may be enough to begin disposal of the accumulated particles. If not, a wire or stiff bottle brush might begin the drainage. (Industrial vacuum cleaners do a complete job.)

⚠ WARNING

Never use machine in atmosphere with explosive dust or gases or where exhaust can contact flammable material. Failure to obey warnings can cause injury or death.

W-2068

c). In a safe area, start the engine and idle in neutral. Alternate between idle and high idle for about two minutes.

d). Turn engine off and allow spark arrester to cool.

e). Reinstall the pipe plug and tighten.

⚠ WARNING

AVOID INJURY

The spray tank and system must be emptied of chemical mixture and flushed with clean water before servicing the spray system.

Nozzle Assembly

Figure **[A]** identifies the component parts of the nozzle assembly.

A leaking nozzle indicates a damaged or misaligned diaphragm, a bad or damaged spring within the diaphragm cap, a damaged gasket seat, damaged retainer or cap.

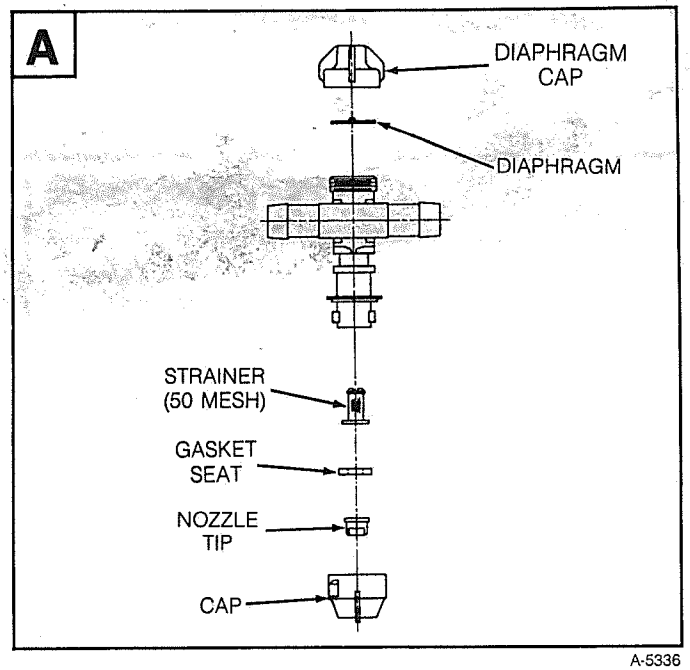
When the problem source is identified, correct or replace component part as required.

Spray Tank

When not in use, the Spra-Coupe (tank) should be stored in a dry dark place. Although ultra violet stabilizers are added to protect the tank from sunlight damage, all polyolefins will deteriorate in time. Storage out of the sunlight will lengthen the life of the tank.

It is suggested that the tank be flushed with water at the end of each use to prevent contamination of other solutions used at a later date.

The strainer in the top opening of the tank **[B]** should always be in place to catch debris or objects from inadvertently falling into the tank while the cover is removed.



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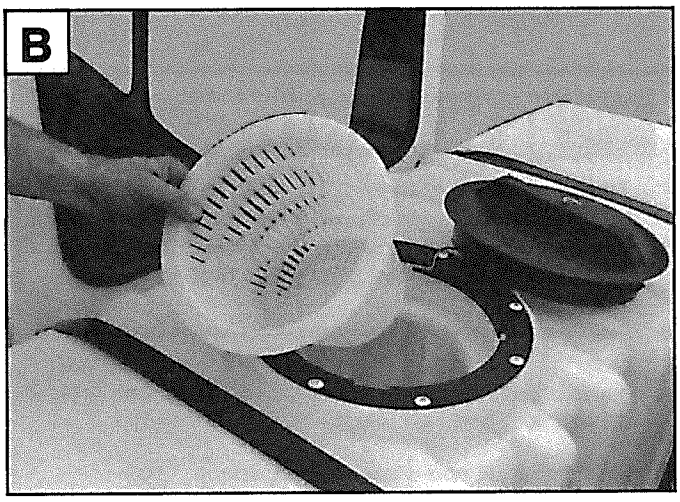


P-1617

BOOM AND SPRAY SYSTEM (Cont'd.)

Booms and Hoses

After 10 hours of operation, check all bolts for tightness and connections for leaks. Check all hoses for chafing or rubbing on frame and body members. If reduced flow is noted in any nozzles, remove cap and clean nozzle strainer.

Check all hose clamps for tightness. Tighten from 50 to 60 in. lbs. (5.65 to 6.78 N'm).

Line Strainer

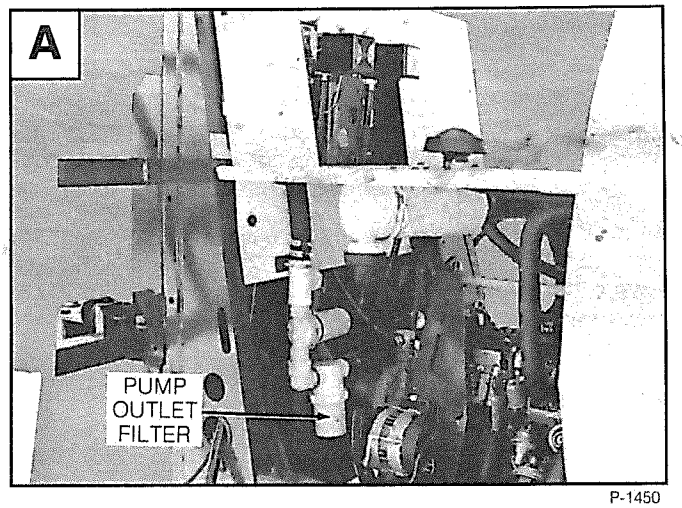
The pump outlet filter **[A]** contains a 40 mesh line screen.

Before servicing or cleaning the filter, close the main line valve and agitation valve **[B]** to retain the water in the tank when the filter cup is removed.

☛NOTE: Water contained in the hoses will empty through the filter when the filter cup is removed.

To service, remove cup and screen. Clean thoroughly and replace after each day's use.

☛NOTE: When reassembling the screen and cup onto the Spra-Coupe, slide the screen into place prior to installing the filter cup. Use the same procedure when O-ring seal replacement is necessary.



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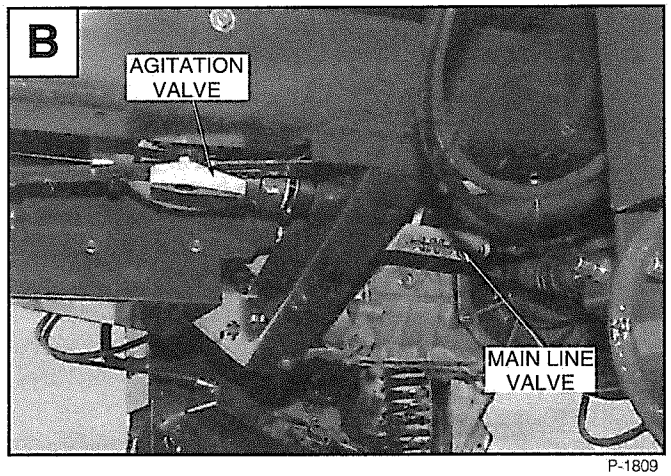


P-1809

ELECTRICAL SYSTEM

The Spra-Coupe has a 12 volt, negative ground alternator charging system. The electrical circuitry is protected by fuses (see page 52 for fuse location and rated amperage requirements). An open fuse in the circuit is a sign of an overload somewhere in the circuitry. Check for broken or bare wiring.

All wiring connections should be checked for tightness periodically and cleaned if necessary. Oxidized terminals cause voltage drops and can in turn, make starting difficult. When replacing electrical components, always use genuine VW and Melroe parts with proper specifications.

Electric System Service

The battery cables must be clean and tight. Remove any acid or corrosion from the battery and cables with sodium bicarbonate and water solution **[A]**.

Coat battery terminals and cable ends with grease. When disconnecting the cables from the battery, disconnect the negative (-) cable first to prevent sparks.

When connecting the cable to the battery, connect the negative (-) cable last to prevent sparks.

Do not interchange battery polarity.

Prevent battery or alternator leads from touching any place on frame or motor, to cause a short circuit.

Always recharge battery after unit storage to minimize use of alternator. Disconnect battery ground cable if a battery charger is used. The only way to effectively recharge the maintenance free battery is using a trickle charger over a two to three day period.

Using A Booster Battery (Jump Starting)

If it is necessary to use a booster battery to start the engine, BE CAREFUL! There must be one person in the Operator's seat and one person to connect and disconnect the booster cables.

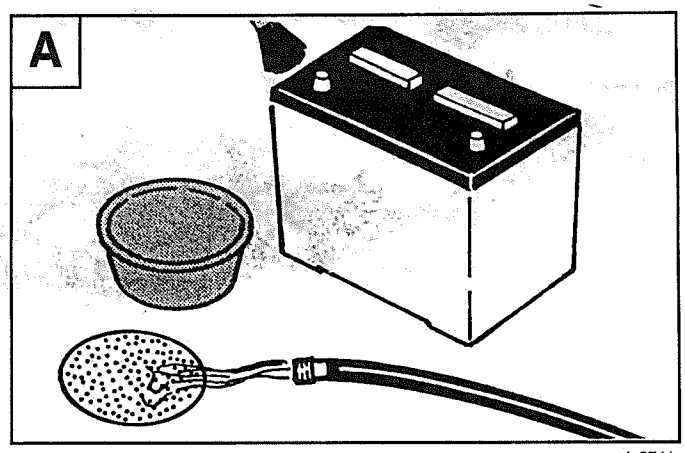
The starting switch must be in the "OFF" position. The booster battery to be used must be 12 volt.

Connect the end of the first cable **[B]** (Item 1) to the positive (+) terminal of the booster battery. Connect the other end (Item 2) of the same cable to the positive (+) terminal of the machine battery.

Connect the end of the second cable (Item 3) to the negative (-) terminal of the booster battery. Connect the other end (Item 4) of the same cable to the machine frame **[B]**.

Engage the hand brake and put the transmission in the neutral position.

Start the engine. After the engine is started, remove the cable **[B]** (Item 4) connected to the frame first. Disconnect the cable (Item 2) from the machine battery.



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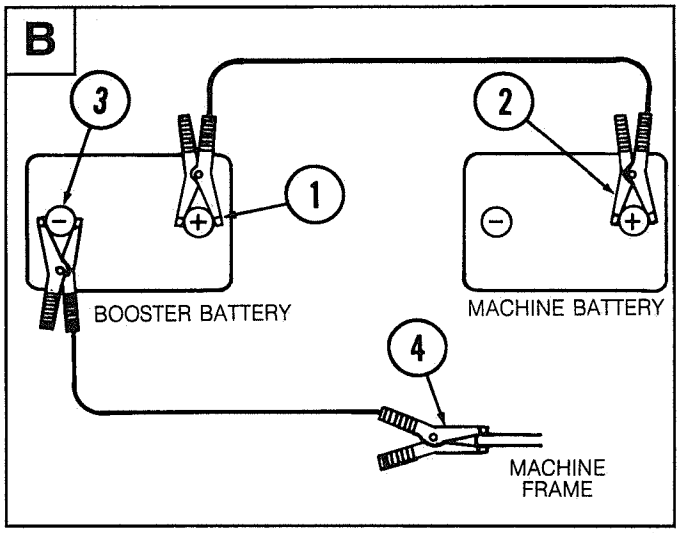


A-5313

⚠ WARNING

Keep arcs, sparks, flames and lighted tobacco away from batteries. When "jumping" from a booster battery, make final connection (negative) at engine frame.

Do not jump start or charge a frozen battery. Warm battery to 60° F. (16° C.) before connecting to a charger. Unplug charger before connecting or disconnecting battery cables.

Battery gas can explode and cause serious injury.

W-2066-0490

IMPORTANT

Damage to the alternator will occur if:

1. **The engine is operated with battery cables disconnected.**
2. **The cables are connected when using a fast charger or when welding on the Spra-Coupe (Remove both cables from the battery).**
3. **The extra battery cables (booster cables) are connected wrong.**

⚠ WARNING

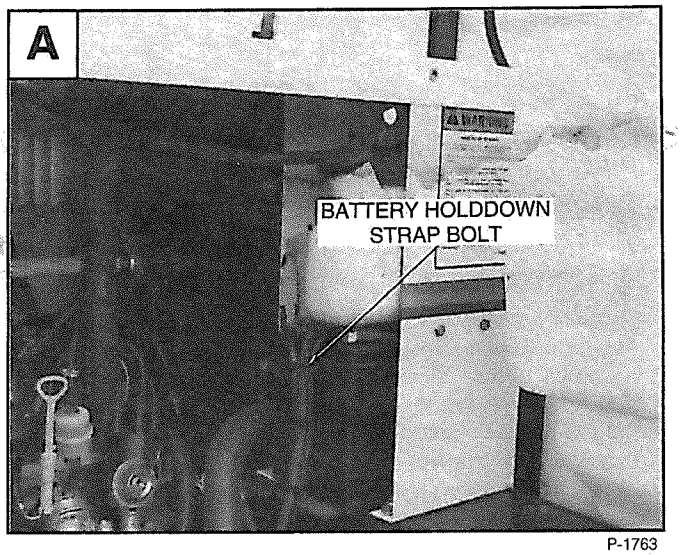
Batteries contain acid which burns eyes and skin on contact. Wear goggles and protective clothing and rubber gloves to keep acid off body.

In case of acid contact, wash immediately with water for several minutes and get medical attention in case of eye contact.

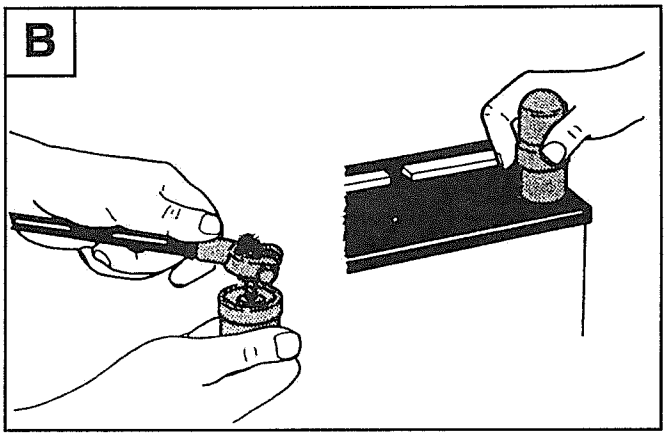
W-2065-1086

Battery Removal and Installation

1. Remove the engine cover on the right side of the engine compartment.
2. Disconnect the negative (-) battery cable.
3. Disconnect the positive (+) battery cable.
4. Remove bolts then remove the battery holddown strap **[A]**.
5. Remove the battery from the Spra-Coupe. Do not touch any metal parts with the battery terminals.
6. Always clean the terminals and cable ends when installing a new battery **[B]**.
7. When installing the battery into the Spra-Coupe, do not touch any metal parts with the battery terminals.
8. Secure battery in place using bolts, spacers and holddown strap as was originally.
9. Connect and tighten the battery cables. Connect the negative (-) cable last to prevent sparks.



P-1763



B-3707

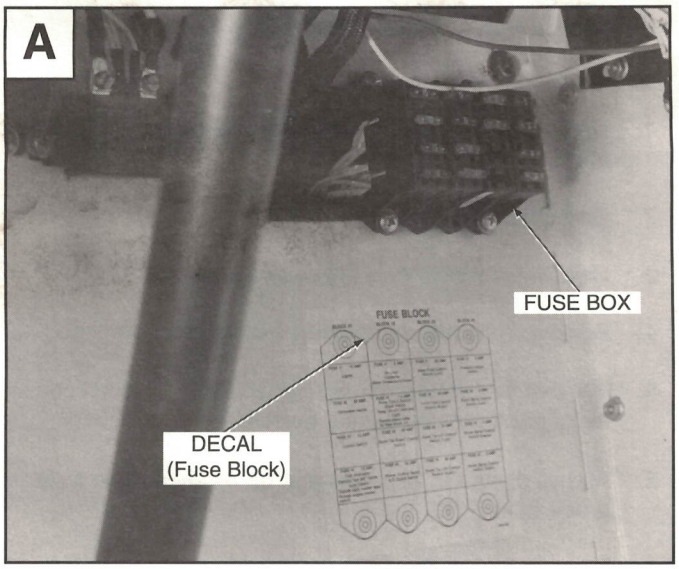
ELECTRICAL SYSTEM (Cont'd)

Fuses

The electrical components are protected from short circuits with fuses. The fuse block is located to the right under the instrument panel **[A]**. The decal affixed to the front panel of the cab lists the fuse size and the circuit that the fuse protects.

Do not use fuses of higher amperage rating than those recommended in the fuse block decal (see illustration below).

Before any electrical equipment is installed after you purchase your Spra-Coupe, please consult your dealer. Certain electrical equipment or the way in which it is installed may adversely affect Spra-Coupe operation, such as the performance of the engine and electrical charging systems. Melroe assumes no responsibility for any expense which you may incur or for any adverse effect upon your Spra-Coupe or any of its components or systems from the installation of additional electrical equipment which is not supplied or recommended for installation by Melroe.

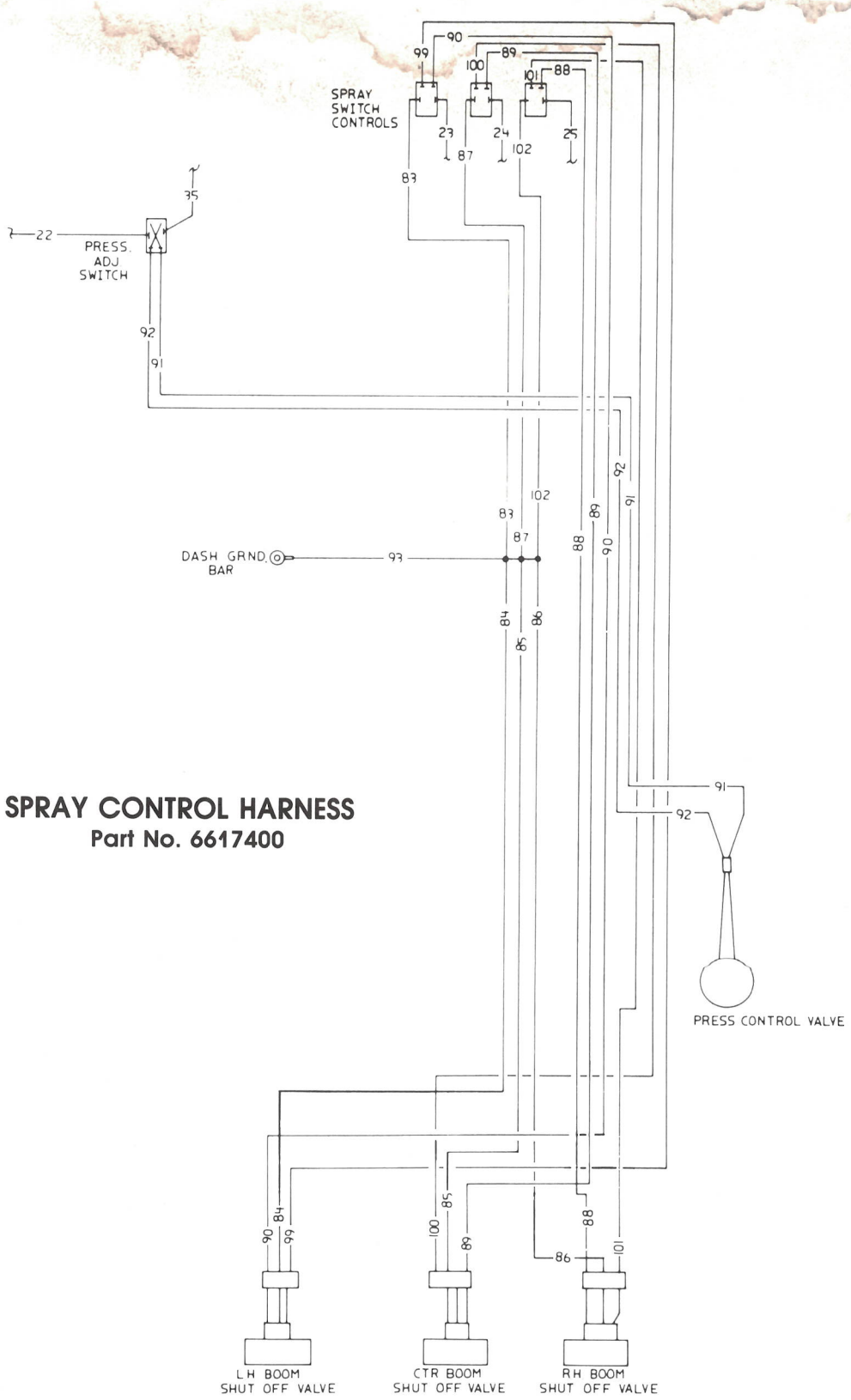


P-1336

FUSE BLOCK

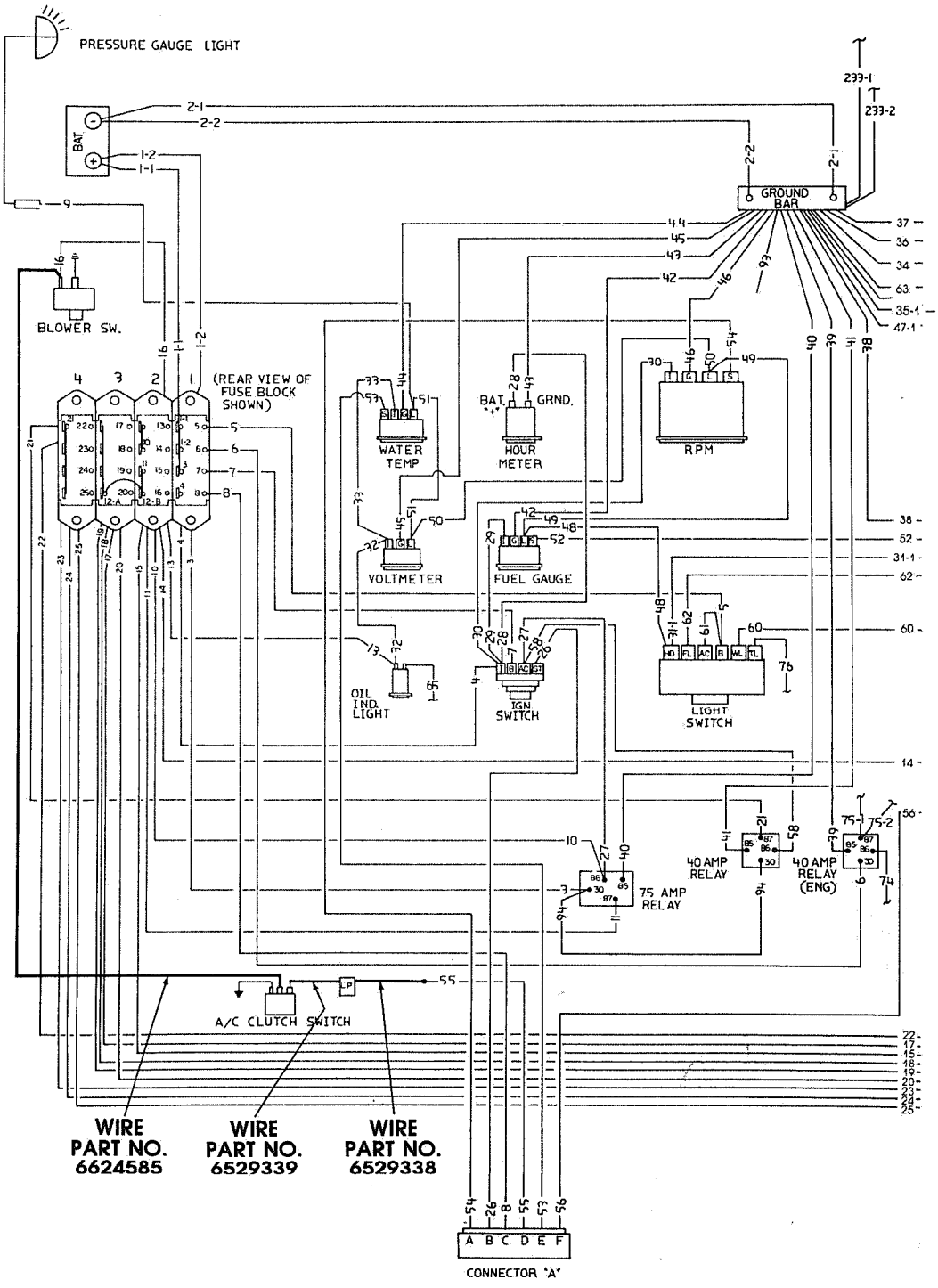
BLOCK #1	BLOCK #2	BLOCK #3	BLOCK #4
FUSE #1 15 AMP. Lights	**FUSE #1 5 AMP.** Oil Light Voltmeter Water Temperature Gauge	**FUSE #1 15 AMP.** Boom Fold Control Switch (Left)	**FUSE #1 5 AMP.** Pressure Adjust Switch
FUSE #2 30 AMP. Carburetor Heater	**FUSE #2 7.5 AMP.** Pump Clutch Switch Wiper Switch Pump "on/off" Indicator Light Signals power relay for Fuse Block #4.	**FUSE #2 15 AMP.** Boom Fold Control Switch (Right)	**FUSE #2 3 AMP.** Boom Spray Control Switch (Left)
FUSE #3 15 AMP. Ignition Switch	**FUSE #3 15 AMP.** Boom "Up/Down" Control Switch	**FUSE #3 15 AMP.** Boom Tip Lift Control Switch (Left)	**FUSE #3 3 AMP.** Boom Spray Control Switch (Center)
FUSE #4 10 AMP. Coil, Alternator, Electric "cut-off" Valve, Auto Choke. Signals carb. heater relay through engine thermo switch.	**FUSE #4 20 AMP.** Blower Control Switch A/C Clutch Switch	**FUSE #4 15 AMP.** Boom Tip Lift Control Switch (Right)	**FUSE #4 3 AMP.** Boom Spray Control Switch (Right)

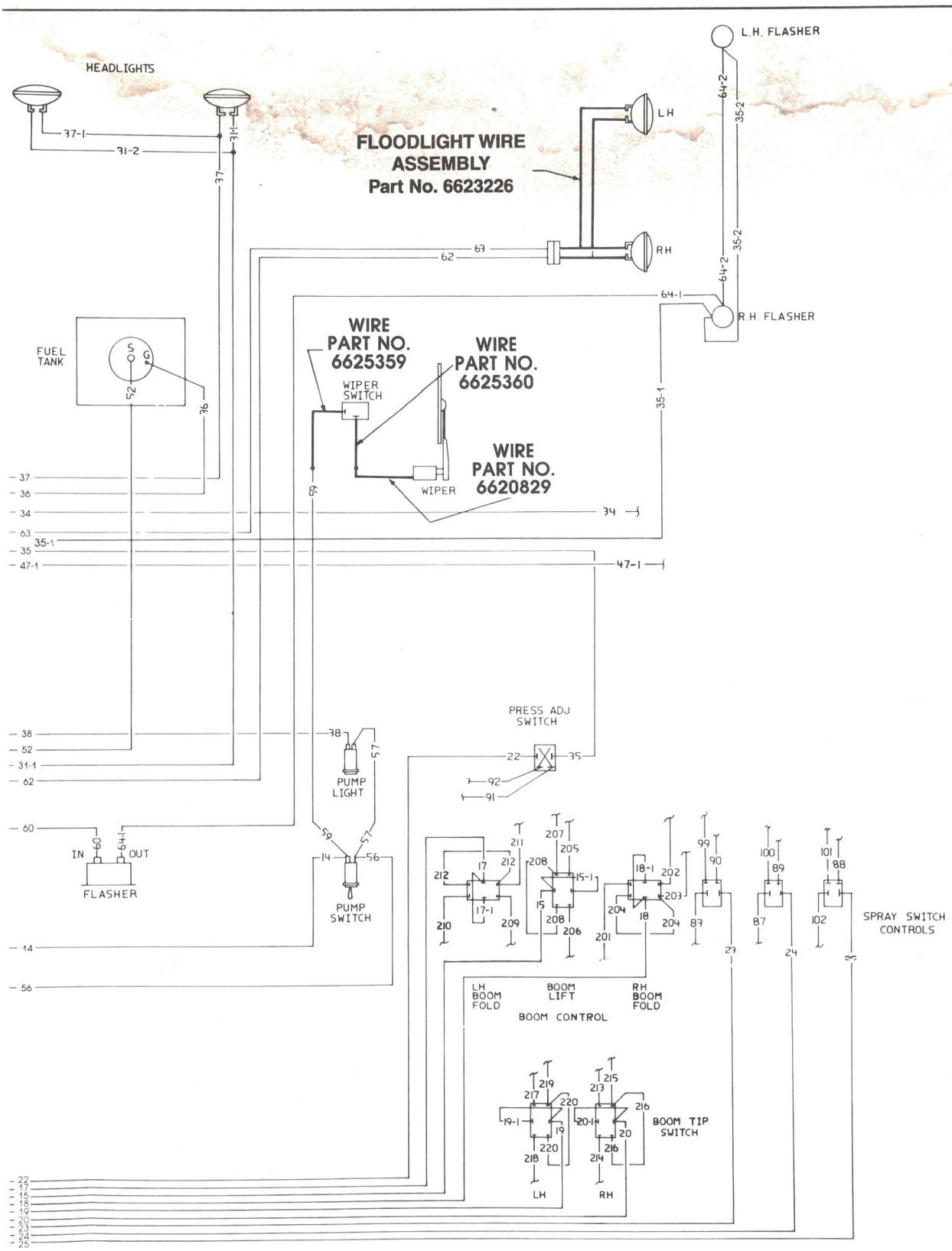
6618243

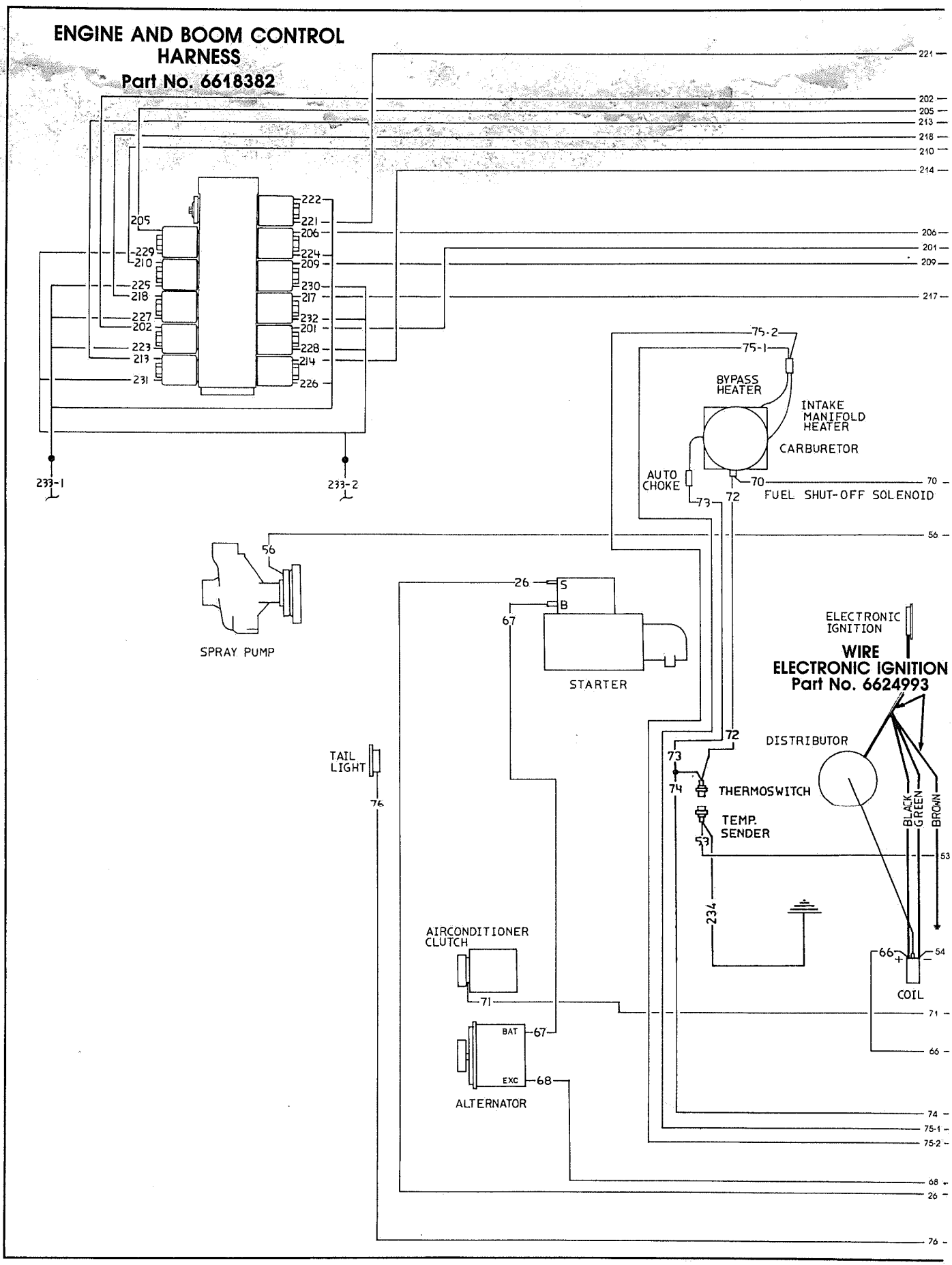


SPRAY CONTROL HARNESS
Part No. 6617400

INSTRUMENT PANEL HARNESS
Part No. 6617402




L.H. FLASHER
HEADLIGHTS
FLOODLIGHT WIRE ASSEMBLY Part No. 6623226
LH
RH
R.H FLASHER
FUEL TANK
WIRE PART NO. 6625359
WIPER SWITCH
WIRE PART NO. 6625360
WIPER
WIRE PART NO. 6620829
PRESS ADJ. SWITCH
PUMP LIGHT
PUMP SWITCH
IN
OUT
FLASHER
BOOM CONTROL
LH BOOM FOLD
BOOM LIFT
RH BOOM FOLD
BOOM TIP SWITCH
SPRAY SWITCH CONTROLS


ENGINE AND BOOM CONTROL HARNESS
Part No. 6618382
221
202
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232
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228
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226
205
229
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225
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227
202
223
213
231
206
201
209
217
233-1
233-2
75-2
75-1
BYPASS HEATER
INTAKE MANIFOLD HEATER
CARBURETOR
AUTO CHOKE
70
FUEL SHUT-OFF SOLENOID
73
72
56
56
SPRAY PUMP
26
S
B
67
STARTER
ELECTRONIC IGNITION
WIRE ELECTRONIC IGNITION
Part No. 6624993
DISTRIBUTOR
72
73
74
THERMOSWITCH
TEMP. SENDER
53
BLACK
GREEN
BROWN
53
234
TAIL LIGHT
76
AIRCONDITIONER CLUTCH
71
BAT
67
EXC
68
ALTERNATOR
66
54
COIL
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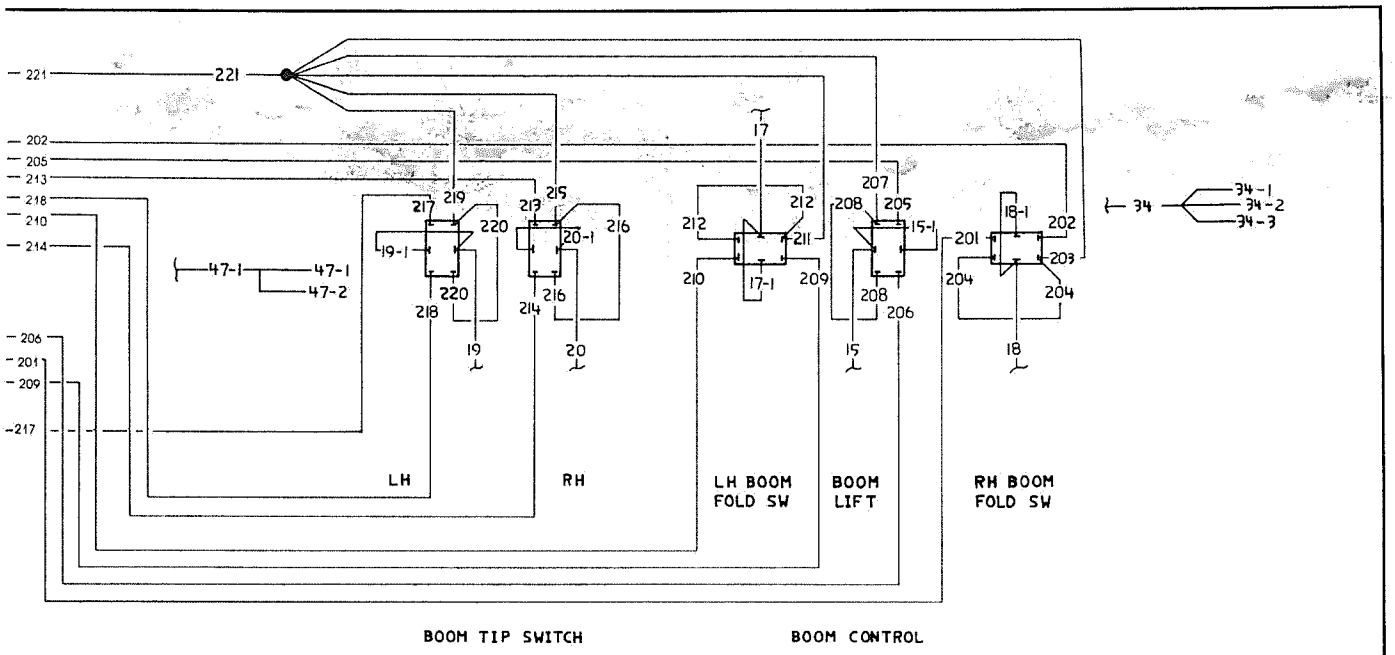
66
74
75-1
75-2
68
26
76


221
202
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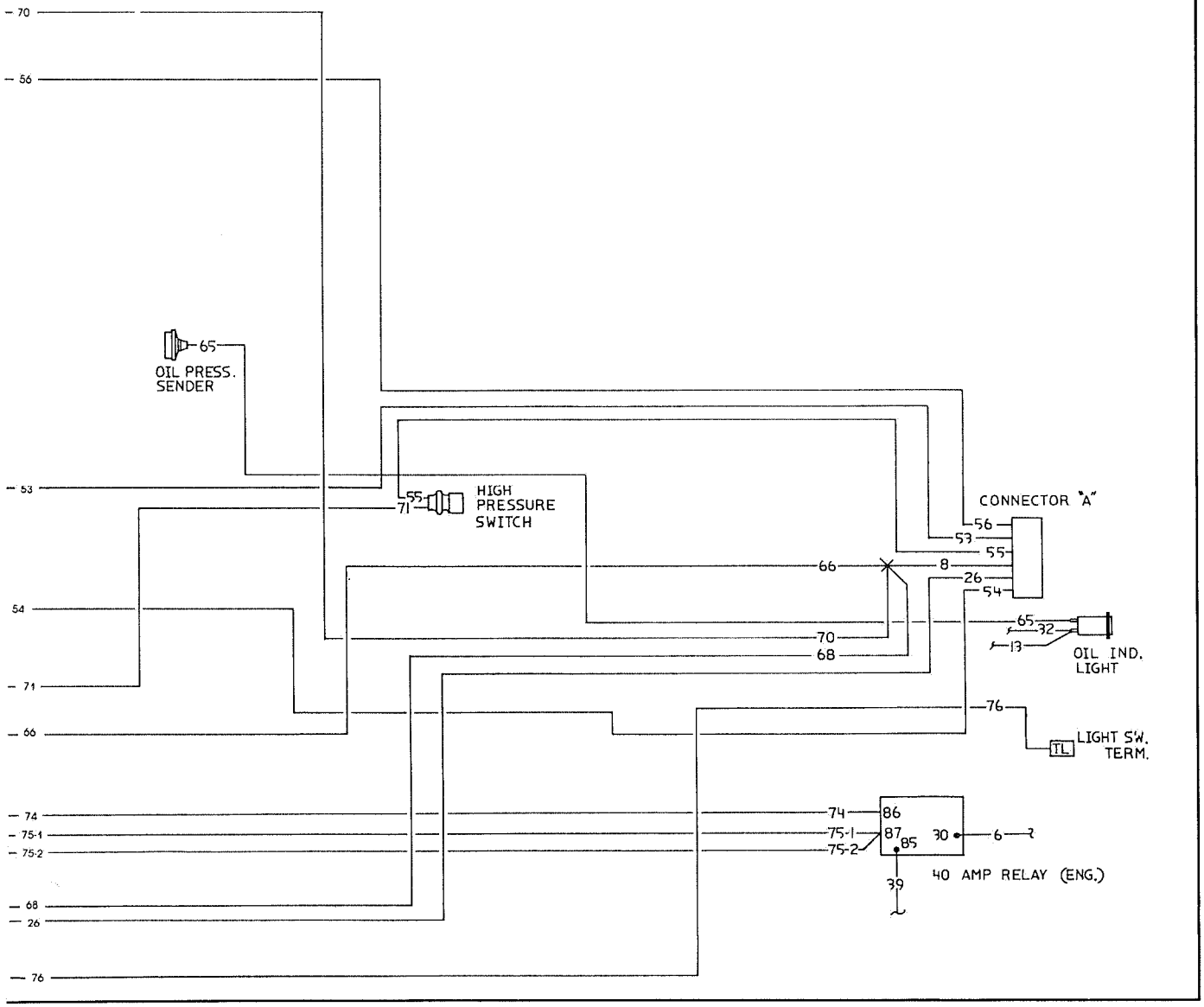
214
206
201
209
217
47-1
47-2
LH
RH
LH BOOM FOLD SW
BOOM LIFT
RH BOOM FOLD SW
34
34-1
34-2
34-3
BOOM TIP SWITCH
BOOM CONTROL


70
56
65
OIL PRESS. SENDER
53
55
71
HIGH PRESSURE SWITCH
CONNECTOR "A"
66
8
26
54
65
32
13
OIL IND. LIGHT
70
68
71
76
66
LIGHT SW. TERM.
74
75-1
75-2
86
87
85
30
6
40 AMP RELAY (ENG.)
39
68
26
76

BELT ADJUSTMENTS

Fan and Governor Belt

See the **"PREVENTIVE MAINTENANCE SCHEDULE"** on page 32) for the service interval. The fan and governor belt tension is adjusted at the governor.

To adjust:

a). Remove the lower governor brace bolt and spacer washers **[A]** (Item 1).
b). Loosen the three (3) governor mounting bolts **[A]** (Item 2).
c). Tighten (or loosen) belt tension by moving the governor until belt is lightly snug. Correct tension to be set to a gauge reading of 42-63 lbs. or so that 4.6 lbs. (20.46N) force produces a deflection of .32"-.48" (8.2mm-12.9mm).
d). Tighten governor mounting bolts **[A]** (Item 2).
e). Add spacer washers as required under the governor brace and secure using brace mounting bolt **[A]** (Item 1).

☛NOTE: Moving the governor for belt adjustment may change the position of the throttle rod [A] (Item 3). Recheck for 3/8" (9.925mm) gap between the carburetor lever and wide open stop pin on the carburetor. (See "ADJUSTING THE GOVERNOR" section on page 38. Readjust if required.)

Alternator and Water Pump Belt

See the **"PREVENTIVE MAINTENANCE SCHEDULE"** on page 32 for the service interval.

The alternator and water pump belt tension is adjusted at the alternator.

To adjust:

a). Loosen the alternator mounting bolt **[B]** (Item 1).
b). Loosen the alternator adjustment bolt **[B]** (Item 2).
c). Tighten (or loosen) belt tension by moving the alternator. Correct tension to be set to a gauge reading of 63-94 lbs. or so that 5.9 lbs. (26.24N) force produces a deflection of .18"-.25" (4.6mm-6.3mm).
d). Tighten the alternator adjustment bolt **[B]** (Item 2).
e). Tighten the alternator mounting bolt **[B]** (Item 1).

Hydraulic Pump Belt

See the **"PREVENTIVE MAINTENANCE SCHEDULE"** on page 32 for the service interval.

To adjust:

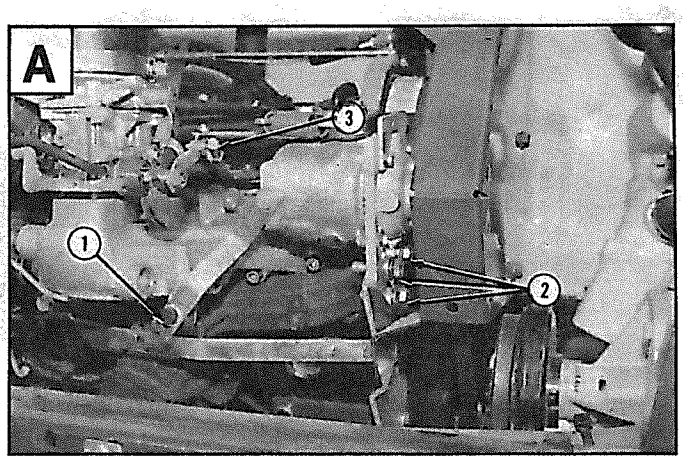
a). Loosen the pump mounting bolts **[C]** (Item 1).
b). Loosen the outer hex nut (Item 2) and turn the adjust nut to tighten (or loosen) belt tension. Correct tension to be set to a gauge reading of 60-90 lbs. or so that 6.3 lbs. (28.02N) force produces a deflection of .16"-.22" (4.0mm-5.6mm).
c). Tighten outer hex nut on the adjust bolt **[C]** (Item 2).
d). Tighten pump mounting bolts **[C]** (Item 1).

Spray Pump Belt

See the **"PREVENTIVE MAINTENANCE SCHEDULE"** on page 32 for the service interval.

To adjust:

a). Loosen the pump mounting bolts (two) **[D]** (Item 1).
b). Loosen the outer hex nut on the adjust bolt and turn the adjust nut (Item 2) to tighten (or loosen) belt tension. Correct tension to be set to a gauge reading of 60-90 lbs. or so that 6.3 lbs. (28.02N) force produces a deflection of .13"-.19" (3.4mm-4.8mm).
c). Tighten pump mounting bolts **[D]** (Item 1).
d). Tighten outer hex nut on the adjust bolt **[D]** (Item 2).



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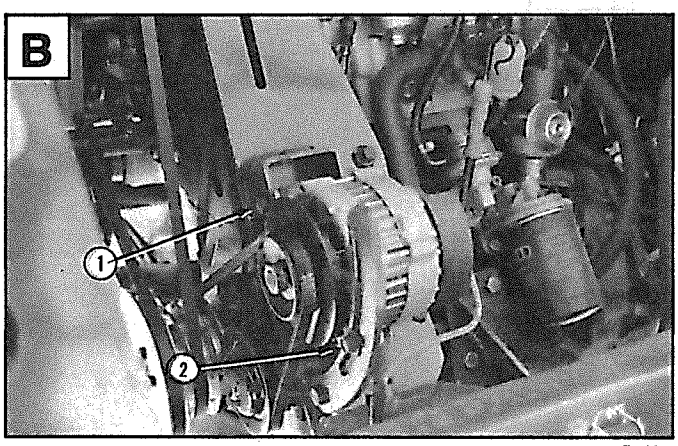
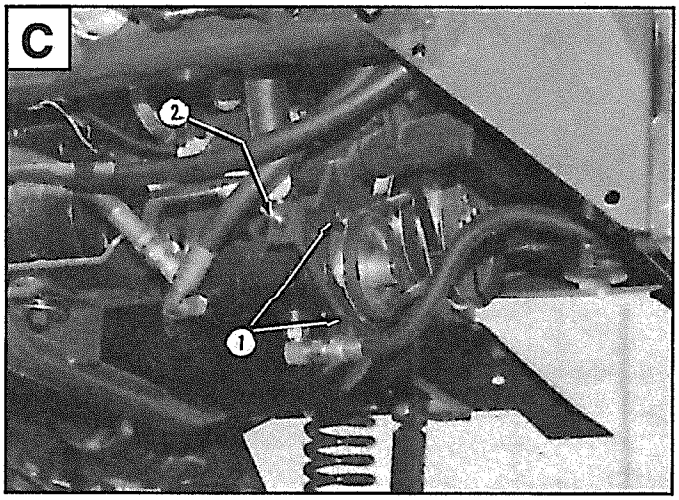


P-1578



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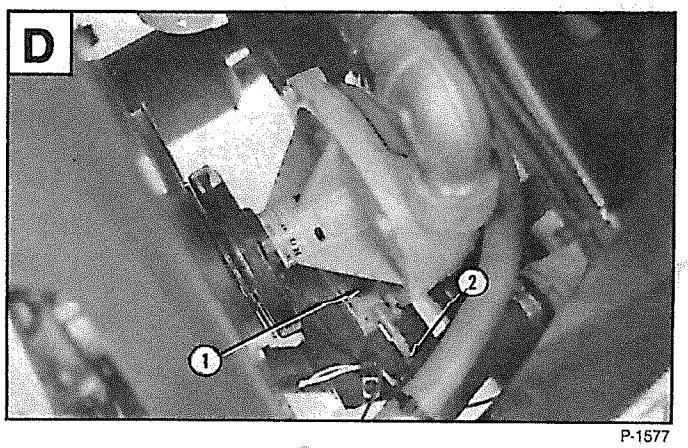


P-1577

STORAGE (Daily and End of Season)

At the end of each day:

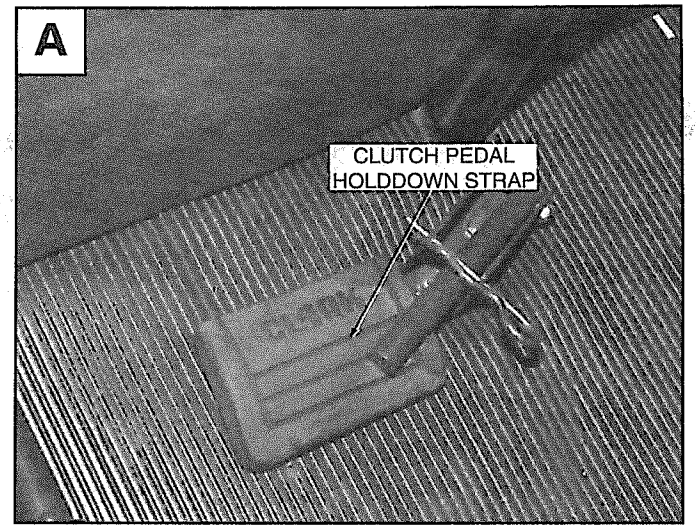
1. Flush the entire system with a water and ammonia solution.
2. Remove and thoroughly clean line strainer and nozzle strainers.
3. Clean all debris from the Spra-Coupe. Include areas within the engine compartment.

☞NOTE: Flammable debris (leaves, straw, etc.) must not be allowed to accumulate near hot surfaces such as the engine and exhaust system. Allowing flammable debris to accumulate will increase the fire hazard. Clean the Spra-Coupe frequently when in use to avoid accumulations.

4. Wash the Spra-Coupe to protect the exterior.

At the end of each season:

1. Add an adequate amount of RV antifreeze into the spray tank and circulate to fill the spray system.
2. Complete engine corrosion protection. See "ENGINE PRESERVATION" section below.
3. Remove and clean battery cables. Store battery in a cool dry place, recharging the battery periodically.
4. Block up machine, taking the load off the tires. Leave tires inflated.
5. When the Spra-Coupe will not be used for a long period of time, especially in areas with high humid conditions, the Spra-Coupe should be stored with the clutch disengaged. This is accomplished by depressing the foot pedal and securing in place with the pedal holddown strap located on the floorboard **[A]**.
6. Apply a liberal amount of grease to exposed cylinder rods when storing the Spra-Coupe for longer periods of time.
7. Store the Spra-Coupe in a dry dark place. Although ultraviolet stabilizers are added to protect the spray tank from sunlight damage, all polyolefins will deteriorate in time. Storage out of the sunlight will lengthen the life of the tank.
8. See Preventive Maintenance Schedule on pages 31 and 32 for proper lubrication prior to storage.



P-1812

Engine Preservation

Volkswagen Industrial Engines should be protected against corrosion depending on the operating conditions.

It is not necessary to use special anti-corrosion oils because good quality HD engine oils designed "SF" according to the API system have adequate corrosion protection properties.

☞IMPORTANT - When you have carried out corrosion protection, you must not run the engine again until it is required for use, as this would destroy the corrosion protection and you would then have to repeat the whole procedure.

Engines which are run under load for at least 20 minutes every two weeks do not need corrosion protection. The oil must, however be changed at the normal intervals as given in the **"PREVENTIVE MAINTENANCE SCHEDULE"** on page 31.

On Spra-Coupes which will not be used for long periods, carry out corrosion protection with fresh engine oil as follows:

- Run engine until warm and then drain oil after stopping engine.
- Put in 2.6 quarts (2.5 liters) of oil and run engine at a fast idling speed for about 30 seconds.
- Remove the air cleaner and slowly pour 1 oz. (30cc) of engine oil into the inlet manifold while the engine is running, then stop engine.
- Remove spark plugs and squirt oil in so that the top halves of the cylinder bores are coated.
- Turn engine over a few times by hand or with starter.
- Spray spark plugs with engine oil and screw them in again.
- Lubricate carburetor linkage with engine oil.
- Seal all openings - exhaust pipe and air cleaner - to keep out dirt and damp air.

SERVICING COMPONENTS

BOOM RETURN SHOCK ABSORBER REPLACEMENT 63

BOOM RETURN SPRING REMOVAL 63

BOOM SELECTOR VALVES 72

ELECTRIC CLUTCH 62

FRONT SUSPENSION (Wide Front) 68-71

REMOVING POWER STEERING AND BOOM CYLINDERS 64

SERVICING POWER STEERING AND BOOM CYLINDERS 65-67

SPRAY PUMP 61

SPRAY PUMP

Pump Disassembly [B]
To replace the seal requires disassembly of only the pump head of the unit as follows:

1. Remove the four casing cap screws (Item 11). Tap pump casing (Item 1) on discharge port with rubber hammer, if necessary, to break loose from mounting flange (Item 10). Remove O-ring (Item 6), discard, and replace.

2. Remove the impeller nut (Item 2) from the shaft. A flat tool may be inserted in the impeller vanes to hold impeller tight when removing nut as shown in Inset A.

3. Pry impeller (Item 3) loose from shaft with two screwdrivers as shown in Inset B. Inspect impeller for damage. Replace if necessary.

4. Remove key on end of shaft (Item 12).

5. Remove rubber washer (Item 4) and rotary seal assembly (Item 5) from the shaft using two screwdrivers to pry out in manner similar to impeller removal. Remove ceramic seal and cup (Item 7) in similar manner.

6. If excessive pump leakage was evident, inspect slinger ring (Item 9) and replace if necessary. Removal of the steel washer (Item 8) may be necessary.

Pump Reassembly [B]
Be extremely careful with the new seal. Take special care not to scratch the lapped sealing faces of the rotary washer and stationary seat.

1. Check that the steel washer (Item 8) is in place.

2. Clean the seal cavity on mounting flange. Coat the ceramic seal and cup (Item 7) with light oil and place it firmly and squarely in the cavity. If this cannot be done with the fingers, use a sleeve which WILL NOT contact the sealing face.

3. Shaft should be clean. Coat the shaft with light oil and slide the seal assembly on graphite end first. Use a sleeve if necessary to prevent the rubber driving ring from pulling out of place as seal slides along shaft.

☞IMPORTANT: Make sure that both sealing faces are absolutely clean, then coat with light oil.

4. With unit held in a vise, position shaft key in key slot and slide the impeller (Item 3) onto the shaft, aligning the keyway in the impeller with the key.

5. Fasten impeller with impeller nut (Item 2). Use a torque wrench and tighten from 40 to 50 inch pounds.

6. Oil a new O-ring gasket (Item 6) and place in position.

7. Replace pump casing (Item 1)

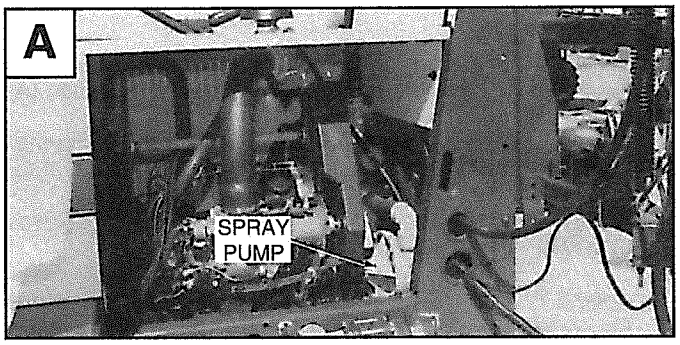
☞IMPORTANT: Never run the pump with the sealing faces dry. The liquid being handled will normally provide sufficient lubrication. A short period of operation is sometimes required to clear up a slight leakage.

WARNING

AVOID INJURY
The spray tank and system must be emptied of chemical mixture and flushed with clean water before servicing the spray system.

WARNING

AVOID INJURY OR DEATH
Agricultural chemicals can be hazardous. Improper selection or use can seriously injure people, animals, plants, soil, etc. Follow instructions from manufacturer on how to select, apply and handle each chemical.



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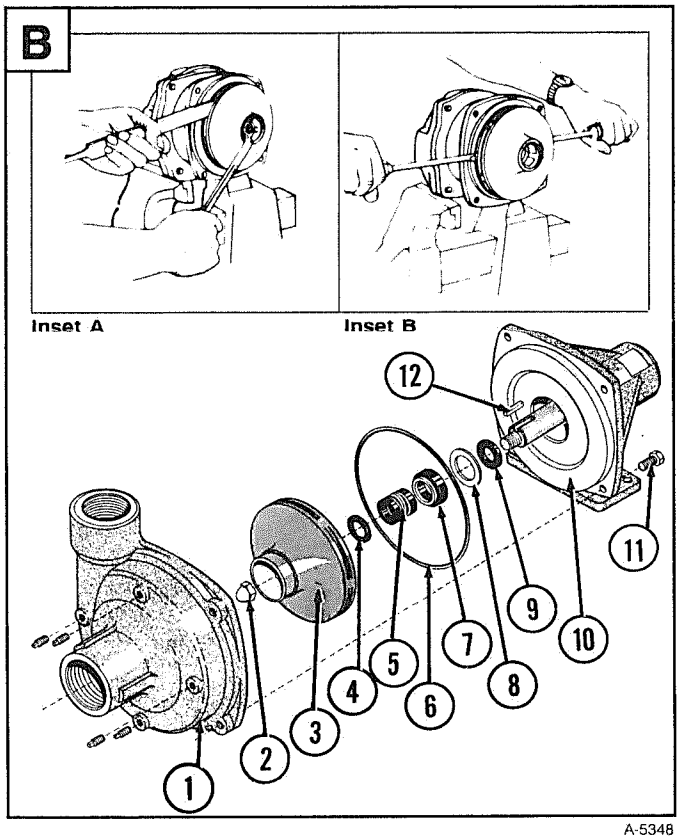

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ELECTRIC CLUTCH

Power to the spray pump is transferred directly from the engine through an electromagnetic clutch. Refer to the following "Clutch Removal" and "Installing the Clutch" procedures if servicing is required.

Clutch Removal

Refer to the following to remove and install the clutch assembly onto the spray pump.

IMPORTANT

Failure to follow the removal and installation procedures can lead to premature clutch failure.

1. Loosen all set screws on the clutch driver and coil ring assembly **[B]**.
2. Place the pump on a press. Position the press plates under the hub end of the coil ring assembly only, as illustrated **[A]**.
3. Place a pin **[A]** (slightly smaller in diameter than the pump shaft) between the end of the pump shaft and the ram of the press.
4. While holding the pump, carefully press the pump shaft from the clutch assembly.
5. Inspect the clutch driver and pulley assembly **[B]**. Check that the clutch plate (located between the driver and pulley) is centered. Rotate the pulley on the driver to check the bearing condition.
6. Repair the clutch assembly as required.

Installing the Clutch

1. Clean and polish the pump shaft. Apply a light coat of oil to aid clutch installation.
2. Place the pump on a flat surface (shaft end up) **[B]**.
3. Using a rubber hammer, tap the end of the pump shaft enough to assure inward shaft and bearing positioning. This will provide the minimum clearance condition that could exist between the coil ring and clutch driver for the procedures that follow.
4. Install the coil ring assembly **[B]** over the shaft and onto the end of the pump. Assure that it rests flush against the end of the pump, then tighten set screws.
5. Install the spacer **[B]** over the pump shaft and through the coil ring assembly.

   Measure the length of spacer beyond the recessed hub of the coil ring **(Minimum of .030 in. required.)**

   Causes for insufficient spacer lengths are:

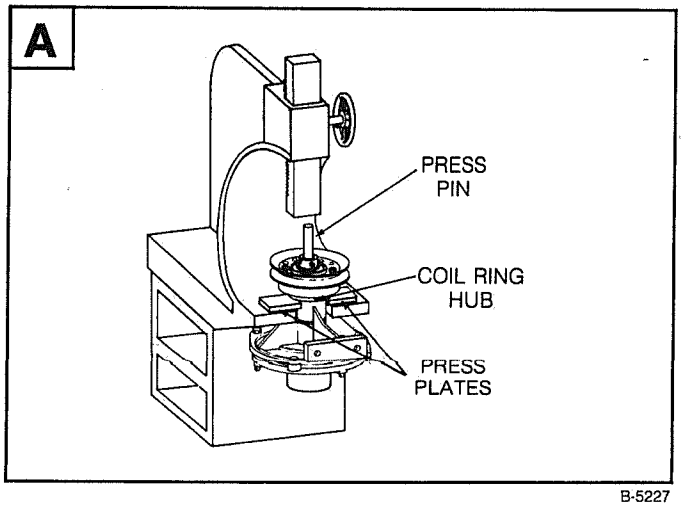
   a) Internal bearing wear.
   b) Insufficient spacer length.
   c) Defective housing.

   Corrections:
   a) Replace bearings
   b) Add washer shim(s) until the correct minimum extending length is obtained.
   c) Replace housing.

IMPORTANT

Operating the clutch with less than the above stated .030 in. of extending spacer will cause clutch failure.

6. Install the clutch driver/pulley assembly (and key) **[B]** onto the pump shaft and against the spacer. Secure set screws. Spin the pulley to check for free rotation.
7. Install pump onto Spra-Coupe using the original hardware. Install pump belt. Belt tension to be set to a gauge reading of 60-90 lbs. or so that 6.3 lbs. (2.9 kg.) force produces a deflection of .13" - .19" (3.4mm - 4.8mm).



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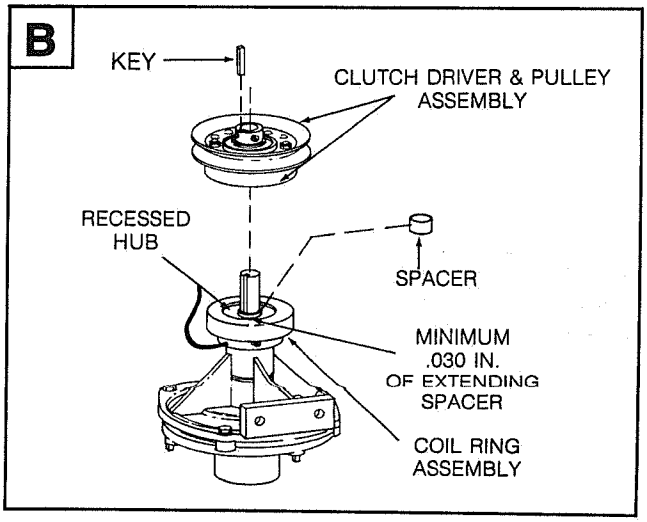

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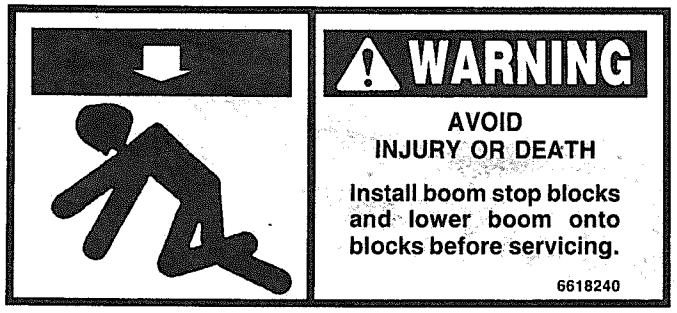


BOOM RETURN SPRING REMOVAL

It is recommended that the boom roller stop blocks are installed and boom lowered onto blocks before working on or near the boom assembly.

See **"ADJUSTING THE BOOM"** section on page 24 for correct stop block installation.

To remove the boom return spring **[A]** use the following procedure:

1. Install eye bolt **[A]** (supplied in the bag of hardware inside the Spra-Coupe) onto each end of the boom return spring. Place the supplied bracket, flat washer and hex nut **[B]** onto the end of the eye bolt on each end of the boom return spring. Secure the bracket to the lower end of the channel on the H-frame using hardware provided as shown in Figure **[B]**.
2. Tighten the hex nut on the eye bolts until the spring releases the pull on the spring mounting plates **[A]**.
3. Loosen (but do not remove) the plate pivot bolt **[A]** (Item 1) on both boom pivot assemblies.
4. Remove spring plate mounting bolt **[A]** (Item 2) (one per side) on both boom pivot assemblies.
5. Remove cylinder mounting pin **[A]** (Item 3) on both boom pivot assemblies.
6. Loosen and remove the hex nut and flatwasher from the eye bolts **[B]**. Rotate the spring mounting plates inward and remove the spring.
7. Reverse the above procedure to install the replacement spring.

NOTE: Remove bracket [B] from both sides of the boom assembly and retain them should servicing in the future be required.

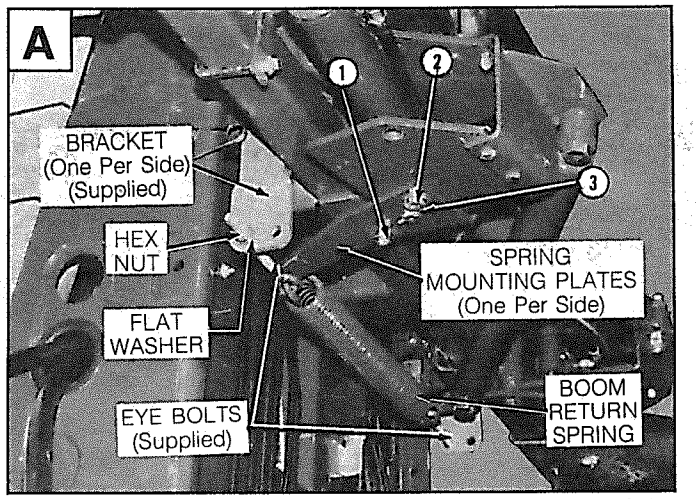
BOOM RETURN SHOCK ABSORBER REPLACEMENT

It is recommended that the boom be fully lowered (to the end of the lift cylinder stroke) or that the boom roller stop blocks are installed and boom lowered onto blocks before working on or near the boom assembly. See **"ADJUSTING THE BOOM"** section on page 24 for correct stop block installation.

When replacing the boom return shock absorbers, reinstall as shown **[C]**. Note the correct "end for end" position of the shock and placement of each end to the mounting plates.

IMPORTANT

Damage to the booms will result if boom return shock absorbers are installed incorrectly.



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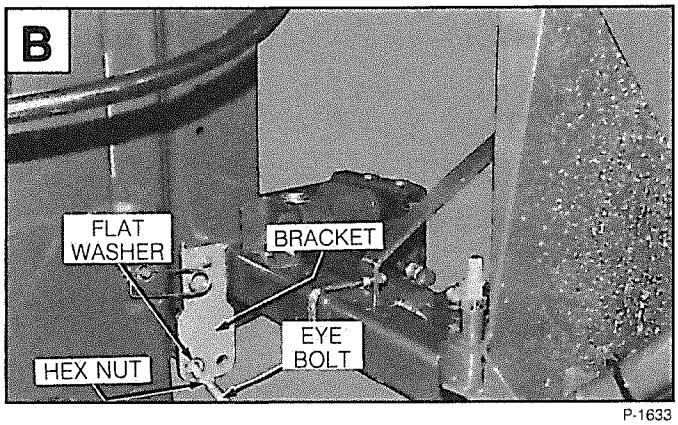

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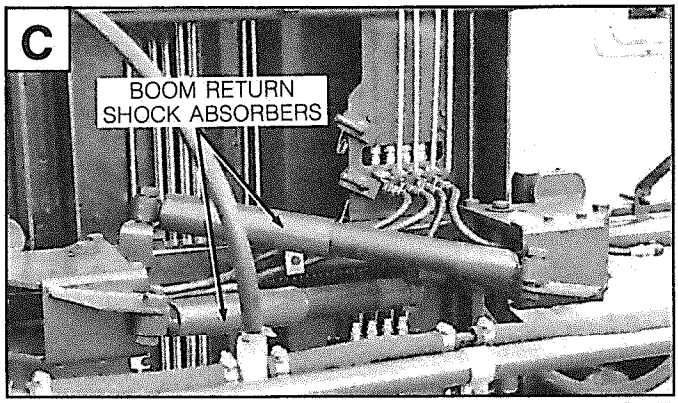

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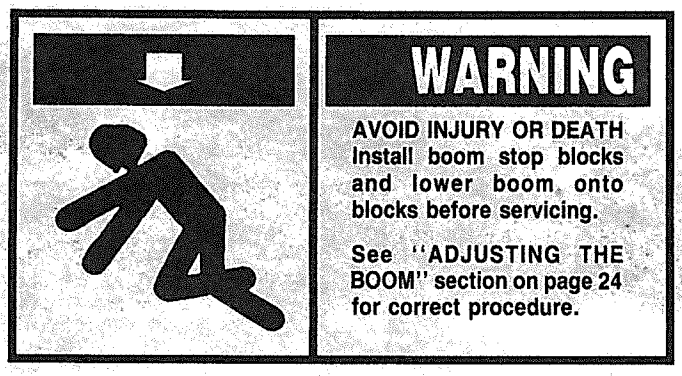


WARNING

AVOID INJURY OR DEATH
Install boom stop blocks and lower boom onto blocks before servicing.

See "ADJUSTING THE BOOM" section on page 24 for correct procedure.

REMOVING POWER STEERING AND BOOM CYLINDERS

I. Boom Lift Cylinder Removal

1. Install boom stop blocks and lower the boom onto the blocks before removing the lift cylinder. See **"ADJUSTING THE BOOM"** section on page 24 for correct procedure.

2. Mark hoses for correct installation before disconnecting. Disconnect hoses from the cylinder **[A]** and plug the end of the hoses.

   Remove the fitting **[A]** from the upper (base) end of the cylinder.

3. Remove upper and lower cylinder mounting pins **[A]** and remove cylinder downward through the mounting bracket.

4. See pages 65 thru 67 for correct procedures to disassemble, replace seals and reassemble cylinders.

5. Reinstall the cylinder onto Spra-Coupe as was originally, reversing the above procedures and tighten hardware.

II. Boom Fold and Tip Lift Cylinder Removal

Before disconnecting the hydraulic hoses from the boom fold **[B]** or the boom tip lift **[C]**cylinders, the booms should be folded and resting on the stop blocks and boom transport carrier.

1. Mark hoses for correct installation before disconnecting. Disconnect hoses from cylinder and plug end of the hoses.

2. Remove cylinder pins and remove cylinder.

3. See pages 65 thru 67 for correct procedures to disassemble, replace seals and reassemble cylinders.

4. Reinstall the cylinder onto the Spra-Coupe as was originally, reversing the above procedures and tighten hardware.

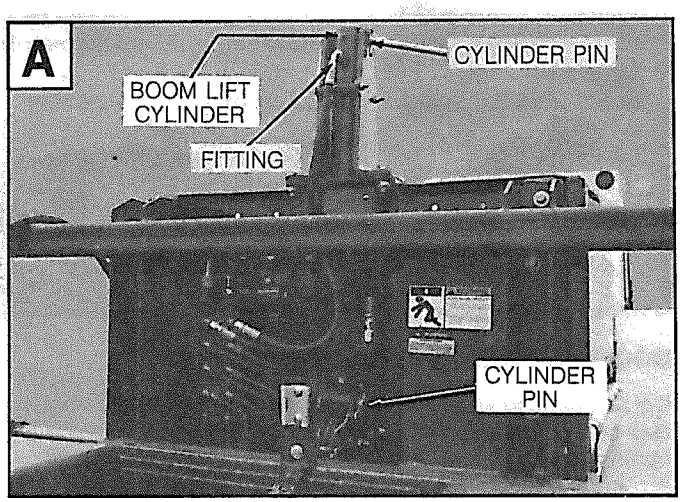
III. Power Steering Cylinder Removal

1. Mark hoses for correct installation before disconnecting. Disconnect hoses from cylinder **[D]** and plug end of the hoses.

2. Remove the bolts securing the cylinder pins in place, then remove pins and cylinder **[D]**.

3. See pages 65 thru 67 for correct procedures to disassemble, replace seals and reassemble cylinders.

4. Reinstall the cylinder onto the Spra-Coupe as was originally, reversing the above procedure and tighten hardware.



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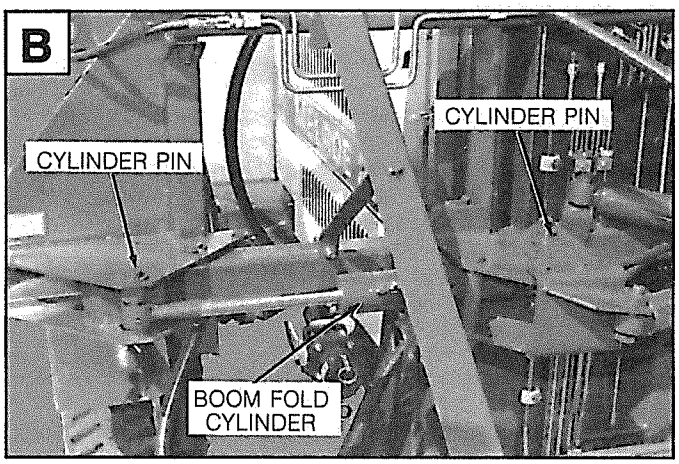

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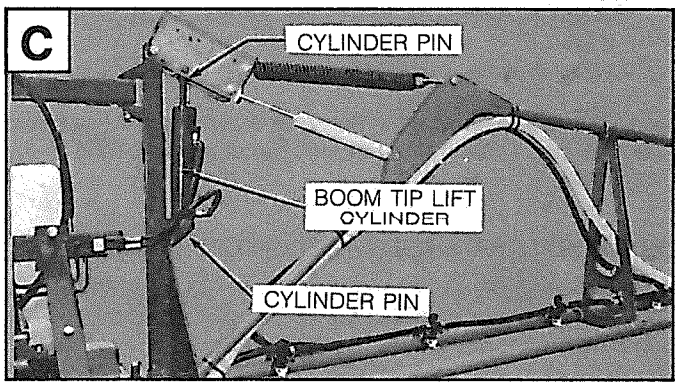

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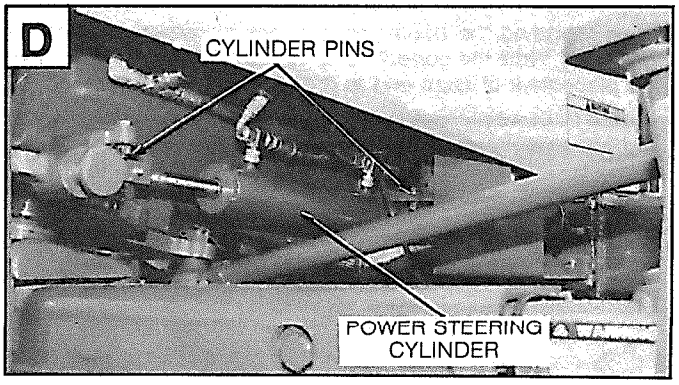

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SERVICING POWER STEERING AND BOOM CYLINDERS

The following procedure can be used to disassemble the boom lift, boom fold, boom tip lift and power steering cylinders.

The tools referenced in the following for servicing the hydraulic cylinders can be purchased from OTC Service Tools, Owatonna, Minnesota (1-800-533-0492).

I. Cylinder Disassembly

The tools listed will be needed to complete the following procedures.

MEL1075 — Adjustable Gland Nut Wrench (for boom cylinders only)

MEL1076 — Cylinder Wrench (for power steering cylinder only)

MEL1074 — O-Ring Seal Hook

1. Move the rod in and out to remove the fluid from the cylinder barrel.

2. Secure the base end of the cylinder in a vise. Remove the end cap from the cylinder using a gland or cylinder wrench **[A]** (depending on type of cylinder cap being removed).

3. Remove the cylinder rod, end cap and piston from the cylinder barrel.

   (To limit the stroke, a stop sleeve is installed on the rod of the boom tip lift cylinders only **[B]**).

4. Secure the clevis end of the cylinder rod in a vise **[C]**.

   To remove the piston from the boom fold or boom tip lift cylinder rod, remove piston nut using a ¾" socket, then slide piston off the end of the rod.

   The piston of the power steering cylinder is threaded onto the rod and secured with a set screw. An extra strength thread-locking adhesive was applied to the threads on the rod and piston to prohibit thread separation.

   ☛NOTE: Remove o-ring and seal before heating piston.

   To weaken the adhesive for piston removal, heat piston to approximately 500°F (260°C). Remove set screw and piston while hot **[C]**. Remove end cap from the cylinder rod.

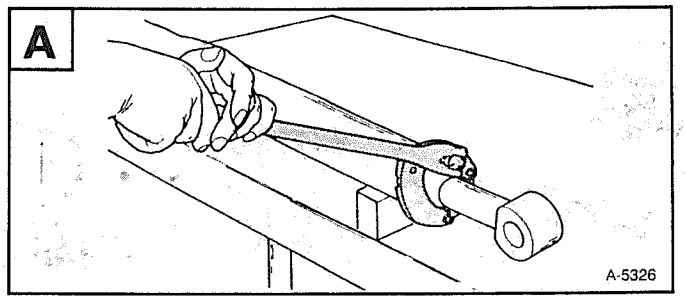
5. Remove the o-ring(s) and back-up washer from the end cap **[D]**.

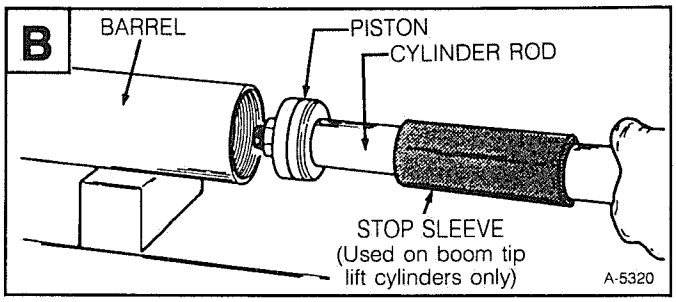
6. Remove the wiper seal and oil seal from the end cap **[E]**.

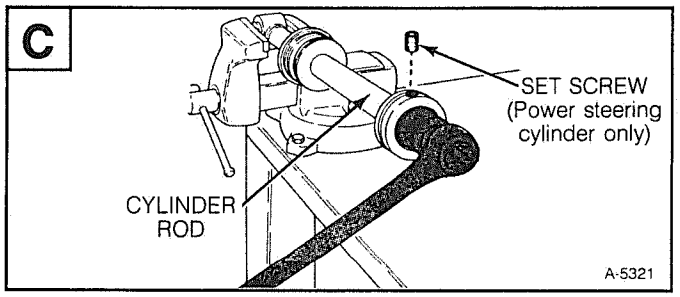
7. Remove the Teflon seal and o-ring from the piston **[F]**.

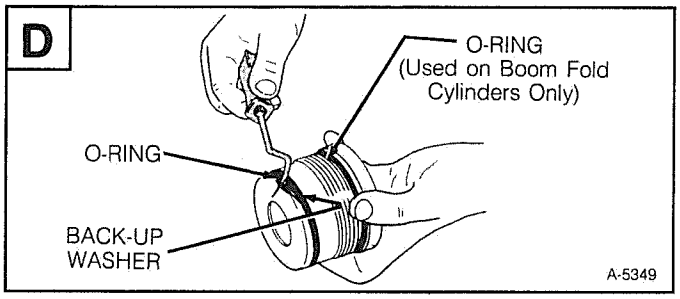
8. Wash all the parts in clean solvent. Dry with air only. Destroy old seals and o-rings.

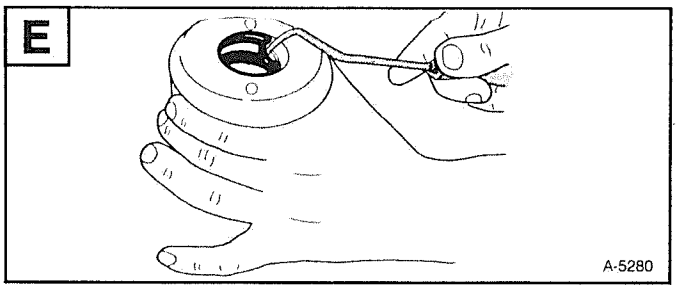
9. Insepct the parts for scratches, nicks, bent, etc. Replace the parts as needed.

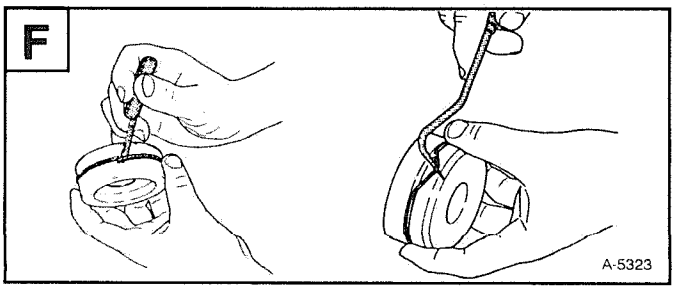












II. Installing Replacement Seals

The tools listed will be needed to complete the following procedures:

MEL1032 — Rod Seal Installation Tool

MEL1008 — Seal Installation Tool (2")

End Cap Seals

1. Install the oil seal **[A]** in the second (innermost) groove inside the end cap.

   ☛NOTE: Install so the o-ring side of the seal [A] is toward the inside of the cylinder (when the end cap is reinstalled.)

2. Install the wiper seal **[B]** in the first (outermost) groove inside the end cap. The seal lip goes to the outside of the end cap.

3. Install o-ring **[C]** (Item 1) onto the end cap (boom fold cylinders only).

4. Install the back-up washer first, then o-ring onto the end cap **[C]**.

Piston Seals

1. Install the o-ring on the piston using the tool **[D]**.

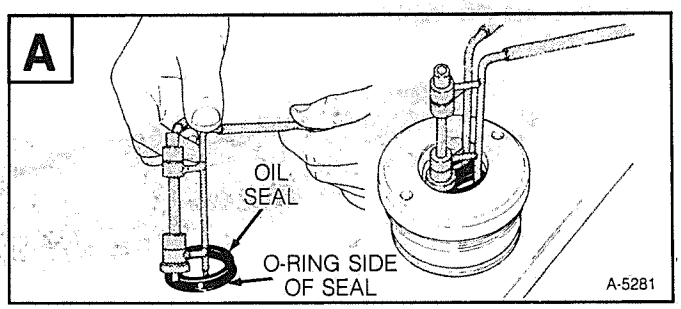
2. Install the Teflon seal over the tool and on the piston **[D]**.

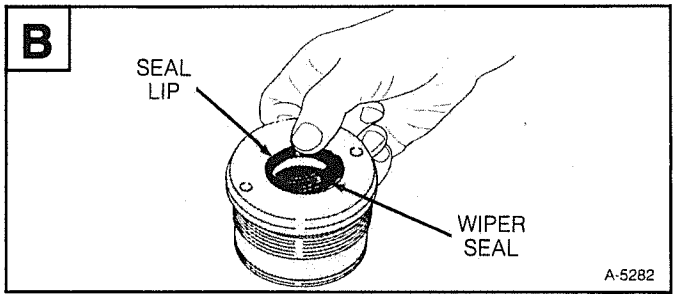
☛NOTE: To prevent damage to the Teflon seal, do not turn it into the piston groove.

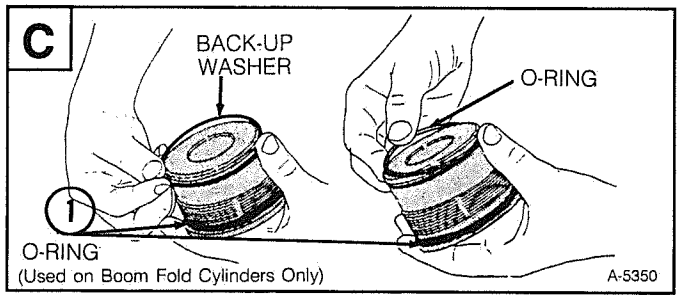
3. Install the piston into the tapered end of the tool to get the Teflon seal to the piston size diameter **[D]**.

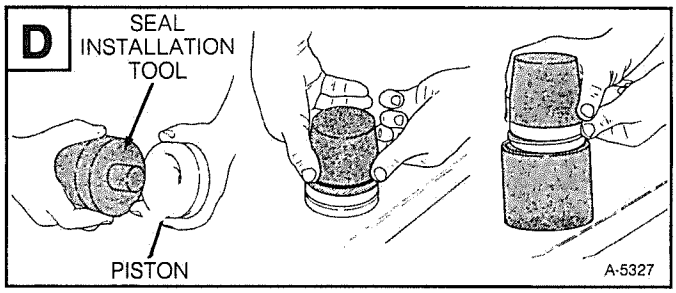
   Wait 5 minutes so that the Teflon seal will become the same size as the piston.

4. Remove piston from the tool.









III. Cylinder Assembly

1. Apply oil on the wiper seal and oil seal and install the end cap onto the cylinder rod **[A]**.

2. On boom tip lift cylinders, install stop sleeve onto cylinder rod.

3. Install piston onto the cylinder rod as follows:

Power Steering Cylinder

a). Thoroughly clean and dry threads on the cylinder rod and piston.
b). Apply extra strength threadlocking adhesive to the rod and piston threads. Coverage of threads should be 100%.
c). Turn piston onto the end of the cylinder rod and tighten. Torque to 100-110 ft.-lbs. (136-150 N'm) **[C]**.
d). Torque set screw to 18-22 in.-lbs. (2.0-2.5 N'm) **[C]**.
e). Wipe excess adhesive from exposed surfaces.

Boom Cylinders

a). Install piston onto the end of the cylinder rod **[B]**.
b). Install piston nut onto the end of the rod and tighten to the following specifications **[C]**.

Boom Lift Cylinder — 150-180 ft.-lbs. (203-244 N'm)

Boom Fold Cylinder — 100-110 ft.-lbs. (136-149N'm) Lubed

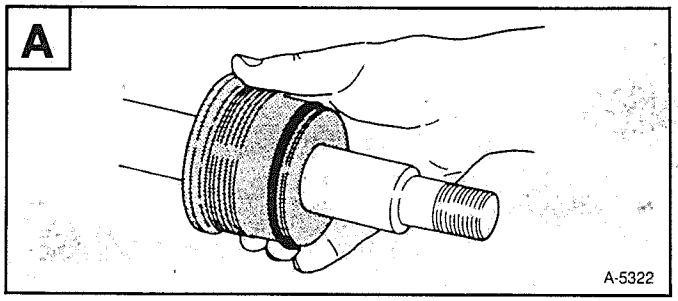
Boom Tip Lift Cylinder - 100-110 ft.-lbs. (136-149 N'm) Lubed

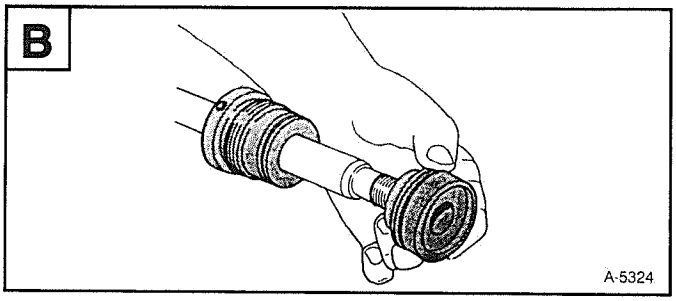
4. Inspect the cylinder barrel bore for scratches.

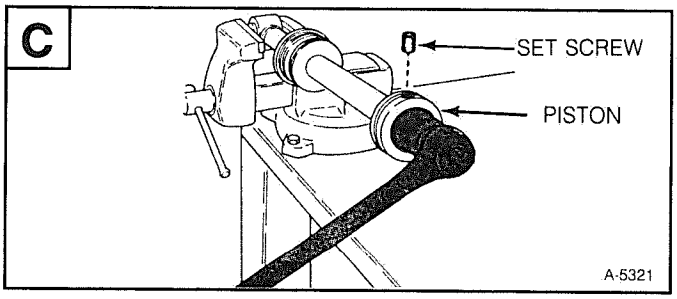
5. Put oil on the seals, o-rings and end cap threads **(D)**. Install the assembly into the cylinder barrel.

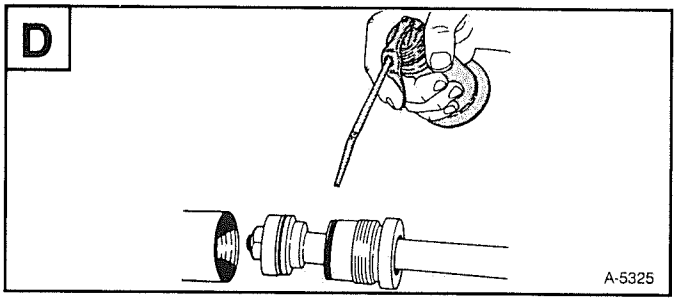
6. Tighten end cap until flush with the end of tube assembly **[E]**

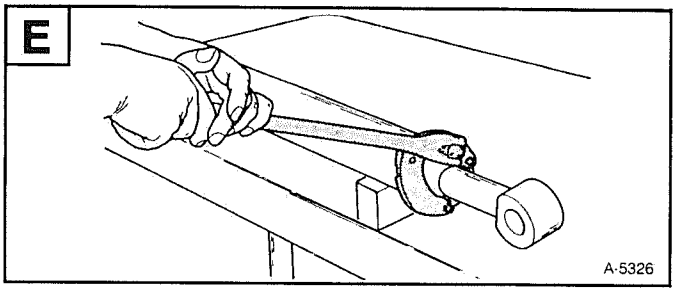
7. Push the cylinder rod in and out the full length of the cylinder housing. It must travel freely through the full stroke of the cylinder with no binding.









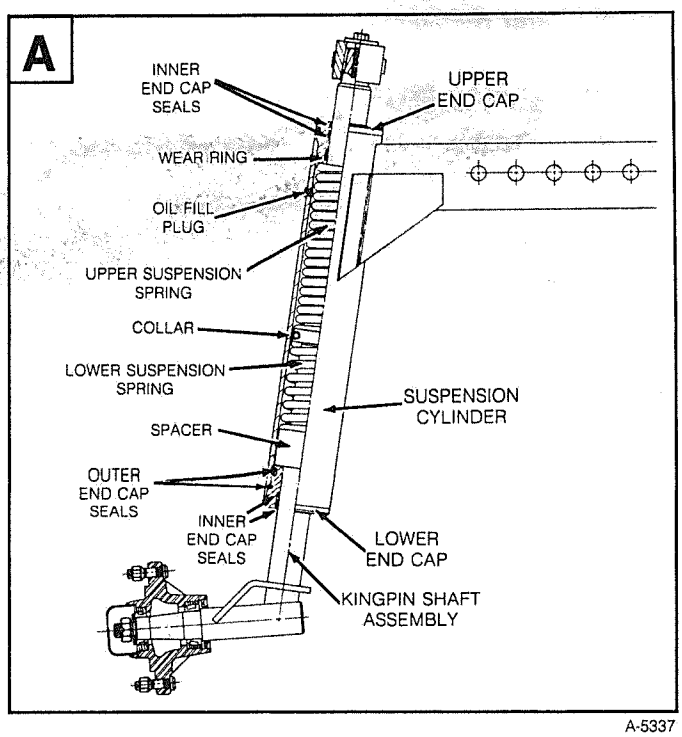


FRONT SUSPENSION (Wide Front)

Figure **[A]** identifies the internal components of the suspension wide front end assembly. Be familiar with the components before continuing with the following service procedures.

I. Removing the Front Suspension Assembly

1. Fold the booms and secure to the front boom carrier.
2. With the Spra-Coupe on a level surface:
   a). Shift the transmission into 1st gear.
   b). Engage the hand brake.
   c). Securely block the front and rear of the rear tires.
3. Remove hex bolt and washer at the top of the kingpin shaft **[B]**.
4. Using a puller tool, remove the steering arm **[C]**.
5. Raise the front of the Spra-Coupe until the tire clears the ground and securely block the machine in position.
6. Remove bolts **[C]** (Item 1), then slide the suspension axle assembly from the wide front frame tube.



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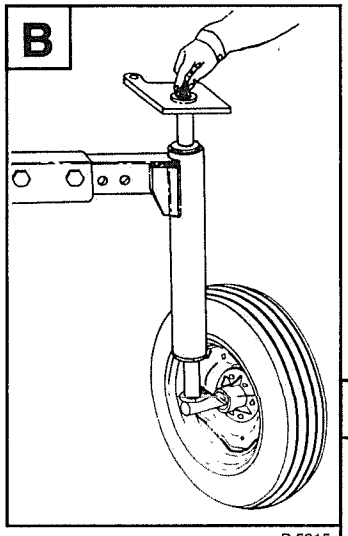

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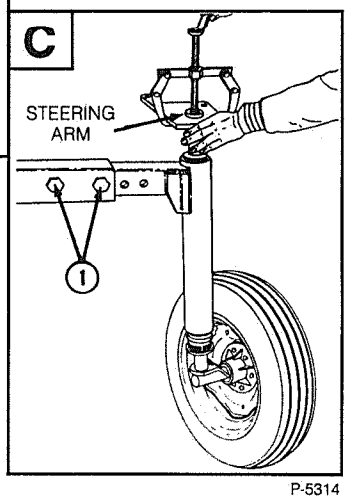

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FRONT SUSPENSION (Wide Front) (Cont'd.)

II. Disassembling Suspension Components

The components inside the suspension tube are under spring pressure. The following procedure is recommended for removal of the lower end cap and disassembly of the suspension components.

⚠ WARNING

AVOID INJURY

The components inside the suspension tubes are under spring pressure. Disassemble as instructed.

There are several items that will need to be acquired to complete the following disassembly procedures:

a). One 1/2" x 6" full course thread hex bolt **[A]**.
b). One 1/2" course thread hex nut and flatwasher **[A]**.
c). One 2 3/4" ID x 5 1/2" long tube (of 1/4" material) with a welded on top plate (of 1/2" material) and with a centered 17/32" diameter hole **[A]**.

To disassemble the suspension components:

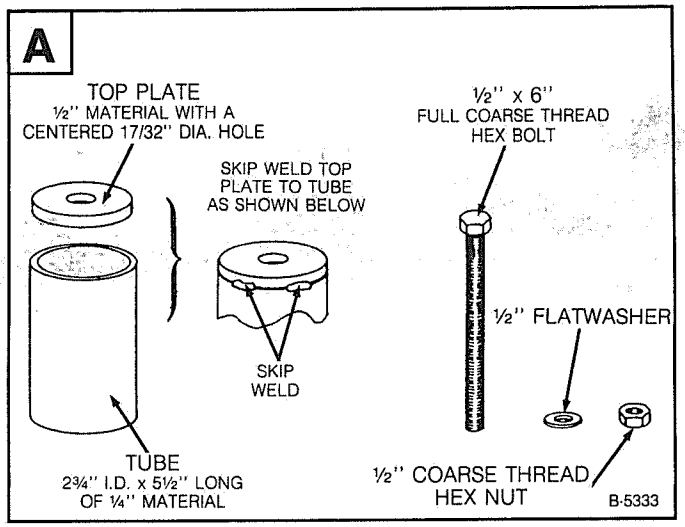
1. Remove the suspension assembly from the Spra-Coupe. See **"REMOVING THE FRONT SUSPENSION ASSEMBLY"** section on page 68 for correct procedure.
2. Assemble the 1/2" hex nut and flashwasher onto the 1/2" x 6" bolt until positioned near the head of the bolt. Install bolt through the hole in the top plate welded to the top of the 5 1/2" long tube **[B]**.
3. Place the tube and bolt assembly into position over the kingpin shaft and onto the end cap at the top of the suspension cylinder **[B]**.
   Turn the hex bolt fully into the threaded hole in the top end of the kingpin shaft.
4. Tighten the hex nut **[B]** to compress the upper suspension spring an additional 3/4" to 1". This will relieve spring pressure on the lower end cap for end cap removal.
5. Remove the lower end cap from the suspension cylinder using a cylinder wrench **[C]**. (Drain the oil from the cylinder into a suitable container.)

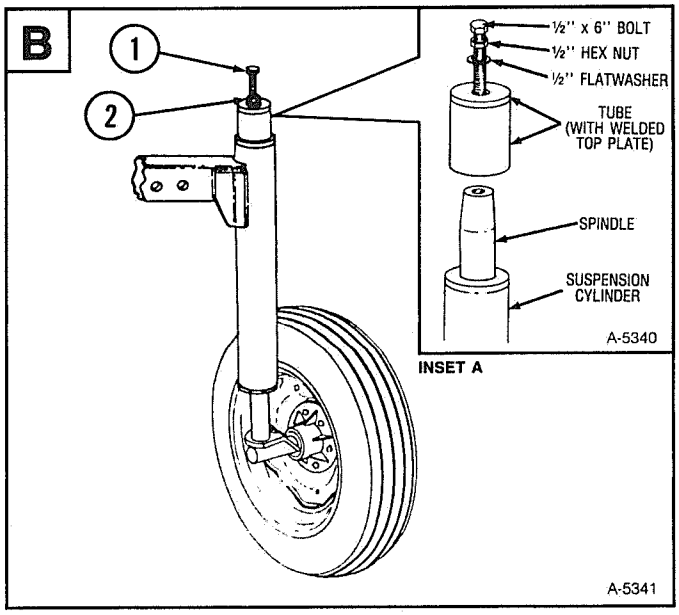
⚠ WARNING

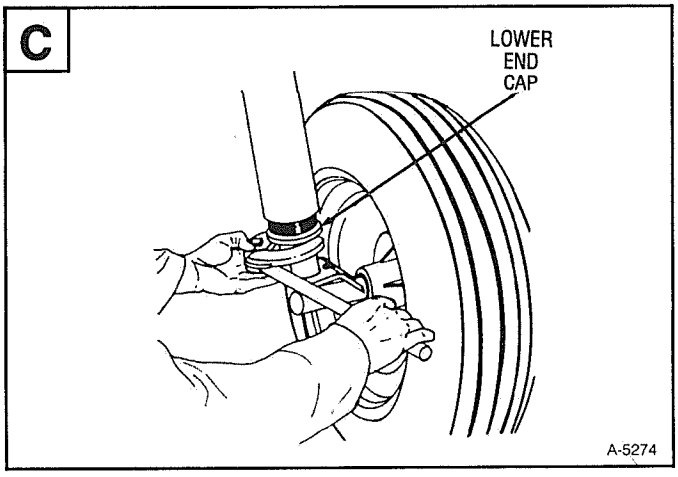
AVOID INJURY

The upper suspension spring is compressed and under pressure. Hold the hex bolt [B] (Item 1) to keep it from turning when loosening the hex nut [B] (Item 2) to decompress the upper suspension spring.

6. Loosen the hex nut **[B]** (Item 2) until the upper suspension spring is completely decompressed, then remove the hex bolt and tube from the kingpin shaft and suspension cylinder.
7. Remove the kingpin shaft assembly from the suspension cylinder.
8. Remover the upper spring from the kingpin shaft.
9. Loosen screws and remove the collar **[A]** (page 68) from the kingpin shaft.
10. Remove the lower spring, spacer and end cap from the kingpin shaft.







III. Servicing The Suspension Components

Springs

Replace the upper or lower suspension spring **[A]** (page 71) if spring failure is observed.

End Cap and Shaft

Inspect for wear and excessive clearance between the kingpin shaft and hole surface of the end cap **[A]**. Worn shaft and end cap can cause excessive oil leakage. Replace end cap and kingpin shaft if needed.

End Cap Seals

Seal replacement is required if oil leakage at the upper or lower end cap was observed.

a). Remove the o-rings and backup washer from the lower end cap **[B]**.

b). Remove the wiper seal and oil seal from the upper and lower end caps **[C]**.

c). Remove the wear ring from the upper end cap **[C]**. To do this, use a screwdriver (or similar tool) to carefully work in behind the wear ring, then crack and remove it from the end cap.

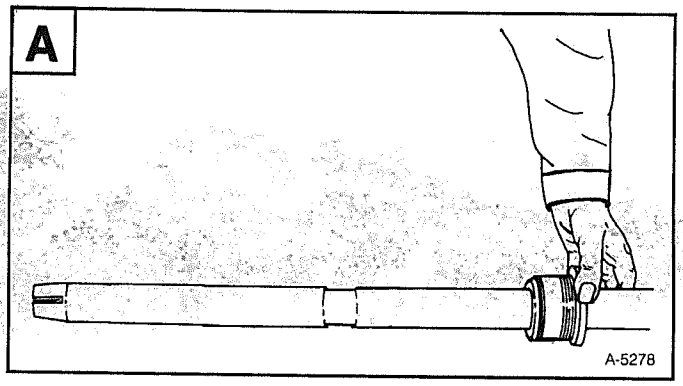
d). Install new wear ring in the innermost groove inside the upper end cap.

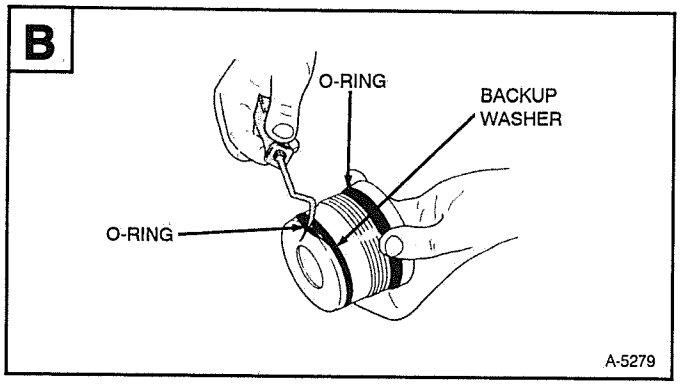
e). Install new oil seal **[D]** in the middle groove on the inside of the end caps.

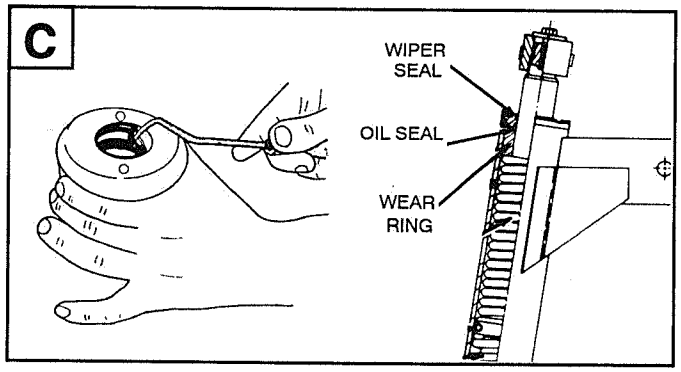
☛NOTE: Install so the o-ring side of the oil seal [D] is toward the inside of the suspension cylinder (when the end cap is reinstalled.)

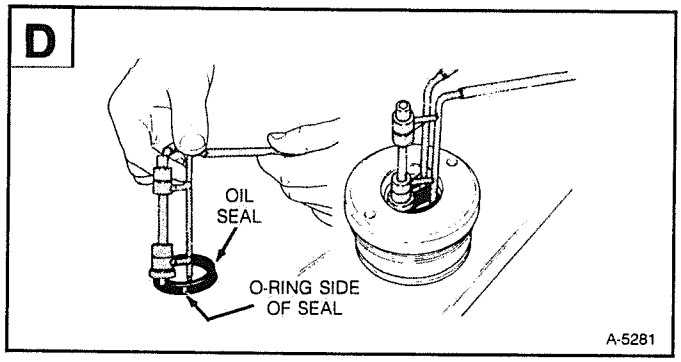
f) Install new wiper seal **[E]** (with seal lip toward the outside of the cap) in the outer most groove inside of the end cap.

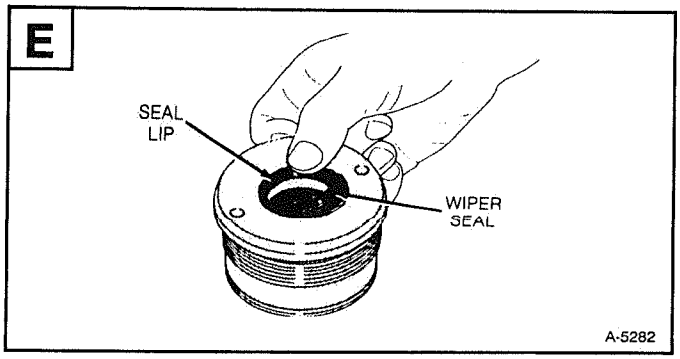
g) Install the backup washer first, then o-ring onto the lower end cap **[F]**.

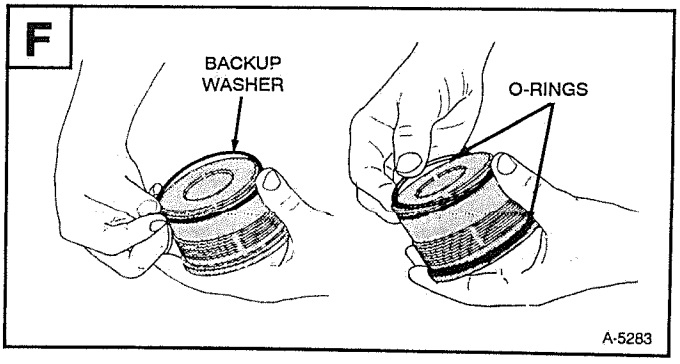










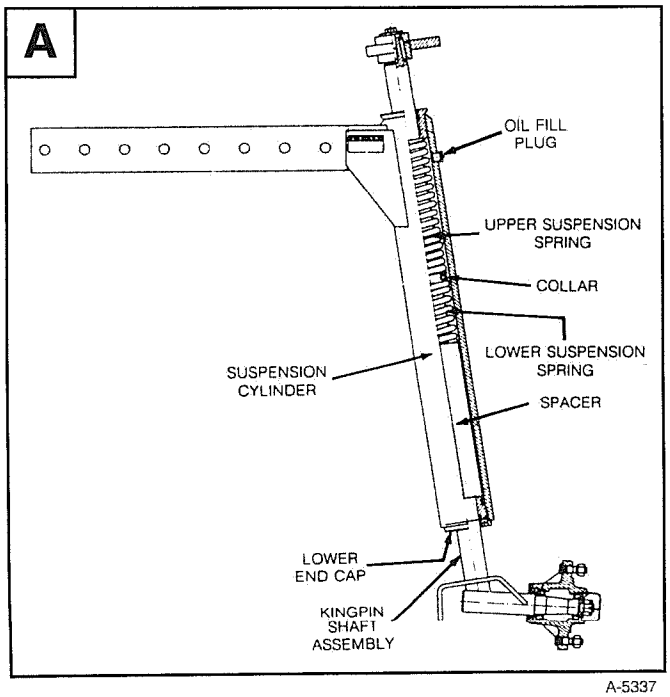


FRONT SUSPENSION (Wide Front) (Cont'd.)

IV. Assembling Suspension Components

☛NOTE: Apply oil to all end cap seals before reassembling the suspension components.

1. Install lower end cap, spacer and lower spring onto the kingpin shaft **[A]**.
2. Install collar **[A]** onto the kingpin shaft and position over the machined groove in the shaft. Apply locktite to threads of collar screws and tighten to 25 to 29 ft. lbs. (33.9 to 39.3 N'm).
3. Install upper spring **[A]** onto the kingpin shaft.
4. Install the kingpin shaft and spring assembly into the suspension cylinder and through the upper end cap **[A]**. Using a rubber mallet, tap the bottom of the kingpin shaft until positioned as far into the suspension cylinder as possible. (At this point, the upper spring should be contacting the upper end cap.)
5. Place the 5 1/2" tube, 1/2" x 6" hex bolt, nut and flatwasher into position over the kingpin shaft and onto the end cap at the top of the suspension cylinder as shown **[B]**. Turn the hex bolt fully into the threaded hole in the top end of the kingpin shaft **[B]**.
6. Slide the lower end cap toward the bottom end of the suspension cylinder as far as possible then measure the distance from the lower end of the cylinder to the shoulder of the end cap as shown in figure **[C]**.
7. Tighten the hex nut **[B]** (Item 2) until the upper suspension spring is compressed to (or slightly more than) the dimension measured in step 6.
8. Turn the lower end cap into the suspension cylinder until fully installed, then tighten using a cylinder wrench **[C]** (Inset A).
9. Remove hex bolt, nut, flatwasher and tube **[B]** from the kingpin shaft.
10. Slide the suspension axle assembly into the wide front frame tube **[D]**.
11. Align holes for wheel spacing desired. Install bolts **[D]** (Item 1) and tighten to 40 ft. lbs. (54.24 N'm).
12. Remove supports and lower the machine to the ground.
13. Assemble the steering arm (and square key) onto the kingpin shaft and secure with original flatwasher and hex bolt **[D]**.
14. Remove oil fill plug **[A]** and add oil into the suspension cylinder to the correct level. (See **"FRONT SUSPENSION OIL LEVEL"** section on page 45). Replace plug and tighten.



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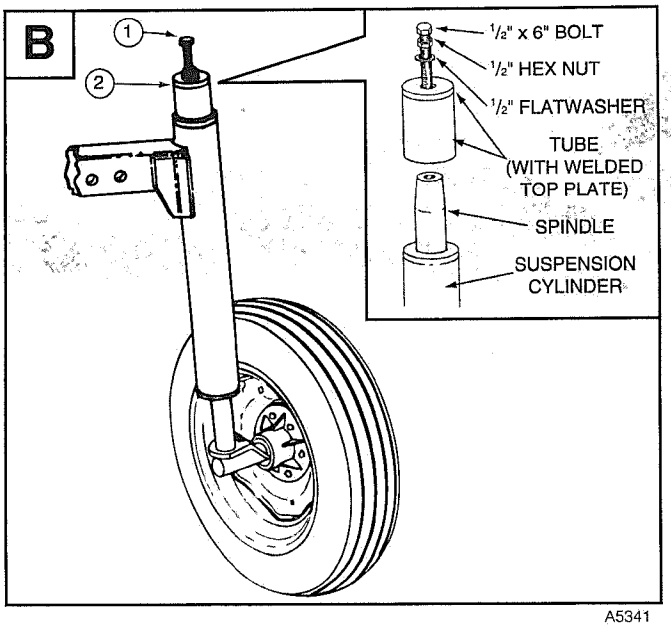

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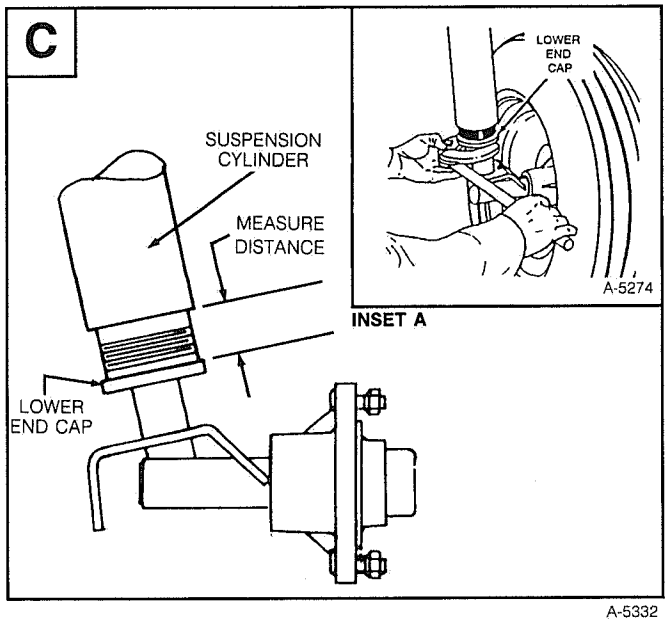

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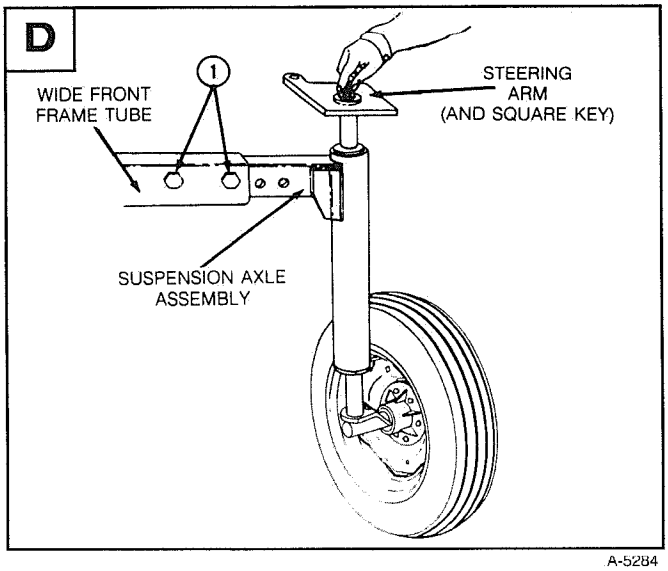


A-5284

BOOM SELECTOR VALVES

The boom selector valves control the flow of liquid to the booms.

After spraying, the valves and entire spray system should be flushed with clear water to remove corrosive agents and assure life of components.

To service the selector valve, use the following disassembly and assembly procedures:

Disassembly [B]

1. Disconnect valve wiring.
2. Loosen four hex nuts (Item 19a), then remove one of the two upper hex screws (Item 18) (located closest to motor housing), lock washers and hex nuts.
3. Slide end caps (Item 17) with remaining screws (Item 18) from the body assembly.
4. Remove four viton o'rings (Item 14 & Item 16) and two teflon seals (Item 15).
5. Loosen and remove two hex nuts (Item 19b) and lock washers (Item 20) from body assembly.
6. Remove body (Item 13).
7. Remove dust plug (Item 22) from body.
8. Remove swing pin (Item 23) and pull ball valve stem (Item 11) from motor shaft (or from body (Item 13)) and remove rotating ball (Item 21).
9. Remove thrust washer (Item 10) from ball valve stem (Item 11).
10. Remove two viton o'rings (Item 12) from ball valve stem (Item 11).
11. Loosen and remove two slotted hex washer screws (Item 9a) from mounting plate (Item 6) and remove cover (Item 1).
12. Inspect, clean and replace parts as necessary.

☛NOTE: The motor sub-assembly (Item2) was not designed to be disassembled.

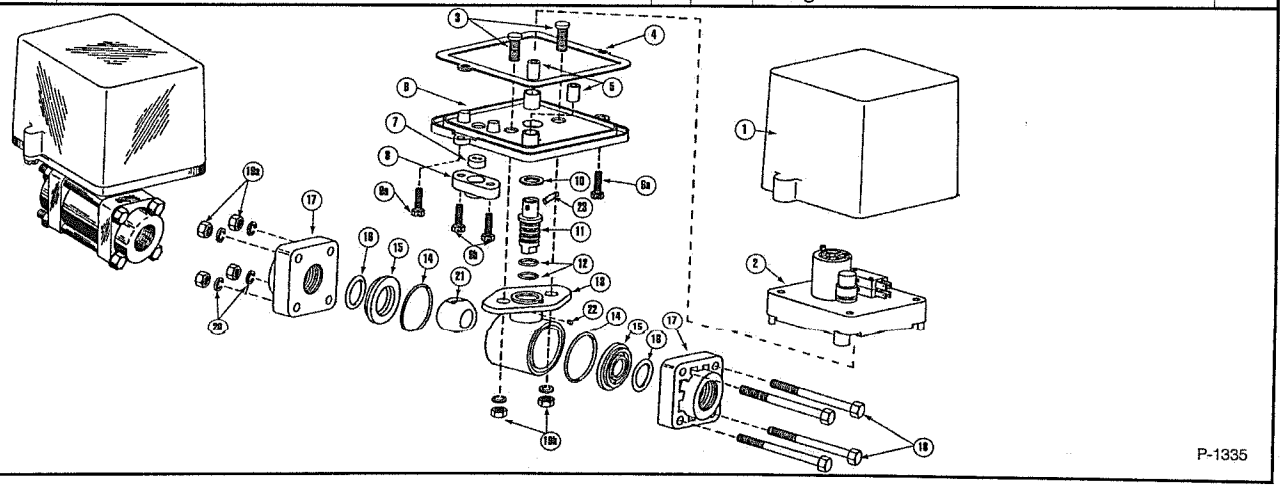
Assembly [B]

1. Inspect motor sub-assembly (Item 2) for loose and/or corroded contacts. Use compressed air to remove dust and moisture. Clean contacts if necessary.
2. Replace cover (Item 1) and gently tighten slotted hex washer screws (Item 9).
3. Stand valve on cover on a flat surface.
4. Place thrust washer (Item 10) on ball valve stem (Item 11).
5. Align flats on motor shaft with ball valve stem (Item 11) flats. Push ball valve stem onto motor shaft until thrust washer (Item 10) is flush with mounting plate (Item 6).
6. Apply a thin coat of white grease on ball valve stem (Item 11).
7. Gently "roll" two viton o'rings (Item 12) into place on the ball valve stem (Item 11).
8. Place clean dust plug (Item 22) into body (Item 13).
9. Align notch on bottom of body (Item 13) flange with detent in mounting plate (Item 2).
10. Slide body (Item 13) over self clinching studs (Item 3) and into place.
11. Align detent in rotating ball (Item 21) with notch on ball valve stem (Item 11) and replace.
12. Place two lock washers (Item 20) and hex nuts (Item 19) on self clinching studs (Item 3) and tighten evenly.
13. Place one set of viton o'rings (Item 14) into body (Item 13) groove and one set of viton o'rings (Item 16) into teflon seal (Item 15) groove.
14. Install teflon seals (Item 15) into body (Item 13) with viton o'rings (Item 16) facing away from rotating ball (Item 21) .
15. Slide body assembly (Items 1 thru 16, 19 thru 21, and 23) between end caps (Item 17). Make sure that the hex head cap screws (Item 18) align with alignment ridges on body (Item 13).
16. Replace hex head cap screw (Item 18) thru end caps (Item 17) and over body (Item 13).
17. Install lock washer (Item 20) and hex nut (Item 19). Uniformly tighten to 15 inch pounds (1.7 Newton-meters) to insure a good seal.
18. Reconnect wiring.

A

ITEM	DESCRIPTION
1	Cover, Polypropylene
2	Motor Sub-Assembly
3	Self-Clinching Stud, Stainless Steel (2 req'd)
4	Gasket, Cell Sponge Rubber
5	Motor Mount, Neoprene (2 req'd)
6	Mounting Plate, nylon (black)
7	Grommetm EPDM Rubber
8	Grommet Retainer, Polypropylene (black)
9	Slotted Hex Washer Screw, Type 430 Stainless Steel (4 req'd)
10	Thrust Washer, Teflon
11	Ball Valve Stem, Nylon

ITEM	DESCRIPTION
12	O'Ring, Viton (2 req'd)
13	Body, Nylon (black)
14	O'Ring, Viton (2 req'd)
15	Seal, Teflon (2 req'd)
16	O'Ring, Viton (2 req'd)
17	End Cap, Nylon (black)
18	Hex Head Cap Screw, Stainless Steel (4 req'd)
19	Hex Nut, Stainless Steel (4 req'd)
20	Lock Washer, Stainless Steel (6 req'd)
21	Ball, Polypropylene
22	Dust Plug, Dense Felt
23	Swing Pin



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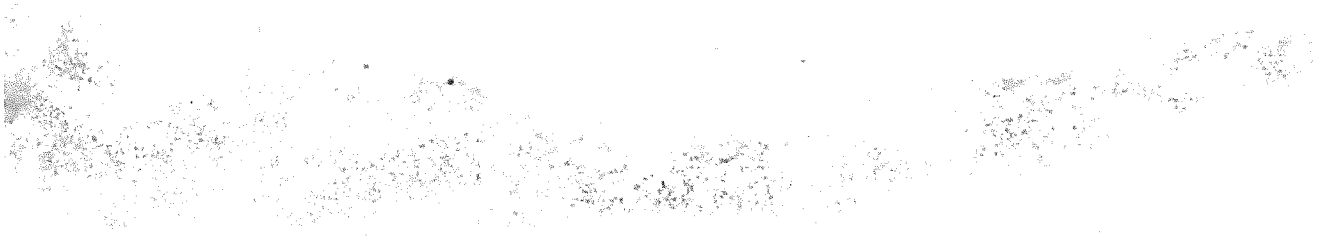

TROUBLE-SHOOTING

⚠WARNING **DO NOT service the Spra-Coupe without instructions and taking the necessary safety precautions. Before working on the Spra-Coupe, read the Safety Instructions at the beginning of this Manual. After making the repair or adjustment, always check the function of the Spra-Coupe. Failure to obey warnings can cause injury or death.**

PROBLEM	PROBABLE CAUSE	CORRECTION
Insufficient line pressure or spray output is inadequate, although sprayer pump is turned on at full engine RPM and boom spray activated.	Shut off valve is closed.	Open Valve.
	Liquid tank is nearly empty.	Check and refill.
	Sprayer nozzle assemblies are plugged or leaking.	Carefully remove nozzles from line, disassemble, clean and flush thoroughly with clear water. Replace worn parts and reassemble.
	Line strainer is plugged or leaking.	Remove cup and screen, clean and flush thoroughly with clear water. Replace worn parts and reassemble.
	Hose is blocked due to foreign material or sharp kinks.	Remove obstacles or replace hose if necessary.
	Electric clutch is not engaged.	Check wire connections to clutch terminals.
	Pump V-belt is slipping.	Adjust belt tension or replace worn V-belt.
	Pump is cavitating.	Remove air from lines, check all fittings and clamps for tightness.
	Pump is worn.	Check condition of pump and replace if necessary.
	Incorrect agitation orifice.	Install smaller orifice to increase pressure.
Pressure gauge does not function.	Hose is plugged, kinked or damaged. Gauge is defective.	Check hose and correct as required. Clean gauge or replace if defective.
Boom operate sluggishly or will not raise, fold or unfold when the engine is running and control switches activated.	Open circuit.	Check for damaged wire, loose connection or open fuse.
	Burned out solenoid on the control valve.	Check and replace.
	Pump belt slipping, off the pulley or broke.	Check and correct. Replace if required.
	Hydraulic oil level low.	Check and fill oil reservoir to correct level.
	Worn and leaky seals in cylinders.	Check and replace.
	Restricted oil flow.	Check for blocked or pinched hose. If pump is cavitating, check for blocked inlet to pump.
		Contact your Melroe dealer for other possible causes within the control valve assembly.

TROUBLESHOOTING (Cont'd.)

PROBLEM	PROBABLE CAUSE	CORRECTION
Boom selector ball valve won't rotate.	No power.	Check electrical connections and power to valve. Check for blown fuse.
	Particles stuck between ball and body.	Disassemble and clean valve.
Boom selector ball valves leak.	Seals are worn.	Check seals and replace if required.
	Hex nuts loose.	Uniformly tighten hex nuts to 15 inch pounds (1.7 Newton-Meters).
Water leakage at pump weep holes.	Inner seals are damaged or deteriorated.	Check and install replacement seal kit.
Pressure adjustment is over sensitive.	Agitation control valve closed or partially closed.	Check and fully open agitation control valve.
Evidence of oil leakage at the upper or lower suspension cylinder, boom cylinders or power steering cylinder end cap.	Worn or damaged seals.	Disassemble and inspect seals for wear or damage. Replace as necessary.
	Worn or damaged kingpin shaft and/or end caps.	Disassemble and inspect for wear. Replace parts as necessary.
Premature tire wear.	Incorrect toe-in adjustment.	Check and readjust.
Evidence of excessive tire wear during transport with transport hitch.	Steering plate not parallel to the front stationary tube of the wide front when toe-in was adjusted.	Check and readjust toe-in.
Wide front wheel assembly sags to one side or suspension cylinder has collapsed onto the axle spindle. Abnormal noise at the wide front assembly evident during operation.	Broken suspension spring.	Disassemble and inspect springs. Replace if necessary.
	Internal collar loose or broken.	Disassemble and inspect condition of collar. Tighten if loose. Replace if damaged.
	Reinstallation of spacer overlooked.	Disassemble and check that spacer is installed. Install if required.

TROUBLESHOOTING (Cont'd.)

PROBLEM	PROBABLE CAUSE	CORRECTION
Engine will not start	Tap closed or filter blocked	Open tap or renew filter
	No fuel in tank	Fill tank
	Ignition leads wrongly connected, loose, damaged or damp	Firing order 1 — 3 — 4 — 2, check wiring connections, renew or dry
	Distributor cap wet inside	Dry cap and rotor arm thoroughly
	Plugs damp (condensation)	Dry plugs inside and out thoroughly
	Plugs soaked with gasoline	Dry plugs, check for defects in fuel system
	Plugs defective, gaps too large	Reset gaps or fit new plugs
	Choke does not close fully when engine is cold, automatic choke defective	Clean the carburetor
	Float needle valve dirty or sticking. Carburetor jets blocked	
Engine starts but idles badly or not at all	Idle jets plugged	Remove and clean
	Air mixture setting too lean or too rich	Adjust air mixture so that engine runs smoothly and exhaust is not sooty
	Electric cut-off **[B]** (Insert A on page 38) failure. When operating properly, a "click" will be heard at the valve when the ignition switch is turned to the "ON" position	Check wiring and/or renew valve
	No valve clearance, valves leaking Intake manifold connections leaking	These faults should be checked and eliminated by a Spra-Coupe dealer because special tools are required.
Engine idles unevenly when warm, exhaust sooty	Choke closed	Check automatic choke
	Air mixture setting too rich	Adjust idling speed so that engine runs smoothly and exhaust is not sooty
	Float needle valve dirty, sticking or worn	Clean or renew valve
Engine misfiring	Ignition leads off	Check leads
	Ignition leads or connectors shorting	Check leads and connectors, renew as necessary
	Plugs dirty or defective	Clean or renew plugs
Engine runs unevenly and stalls frequently	Plug connectors shorting	Renew defective connectors (usually burned)
	Ignition leads shorting	Dry damp leads, renew damaged leads
	Plugs misfiring	Check plugs, clean inside and out, adjust gaps, renew plugs if necessary
	Distributor cap or rotor arm shorting, or tracking due to dampness	Check parts for shorting (burn marks), renew if necessary. If dampness is due to condensation, dry parts carefully
Engine does not run at correct speed	Carburetor/governor not set at 3800 RPM	Adjust for correct engine speeds. See **"ADJUSTING THE GOVERNOR"** section.

TROUBLESHOOTING (Cont'd.)

PROBLEM	PROBABLE CAUSE	CORRECTION
Engine overheats	Coolant level low	Check system for leaks and seal as necessary. Add coolant to correct level
	Belt for mechanical fan slack	Tension belt
	Radiator fins blocked by dirt or foreign bodies	Clean with water and compressed air **Note:** Compressed air pressure must not be too high otherwise radiator will be damaged
	Ignition timing out	Rectify breaker gap and reset timing
	Mixture too lean	Check carburetor settings and adjust correctly
	Automatic spark control not working properly	Clean and repair control mechanism in distributor
Engine runs on	Accelerator controls not in idle position	Move controls to idle position before turning engine off
	Cut off valve **[B]** (Inset A on page 38) failure. When operating properly, a "click" will be heard at the valve when the ignition switch is turned to the "ON" position.	Check wiring, renew valve if necessary
Engine pinks under load	Ignition timing advanced	Adjust timing
	Engine overheating, cooling inadequate	See under "Engine overheats"
	Fuel anti-knock properties too low	Use fuel with better anti-knock properties
	Automatic spark control advancing too much. Spark plug heat value too low	Repair spark control mechanism. Use proper plugs—Ensure that plug washers are fitted
	Excessive carbon in combustion chambers	These faults should be checked and eliminated by a Spra-Coupe dealer because special tools are required.

ACCESSORIES

ACTIVATED CARBON FILTER 80

AIR CONDITIONING 80

CAB INSULATION 81

CROP DEFLECTORS 80

DELUXE SUSPENSION SEAT 81

DROP NOZZLE 82

FLOOD LIGHT KIT 83

FOAM MARKER 81

HAND SPRAYER 83

NOZZLES AND SCREENS 83

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REAR EXTENSION AXLE (220-78" only) 83

SPRA-CONTROLLER
(Manufactured to Melroe Specifications by RAVEN INDUSTRIES INC.) 79

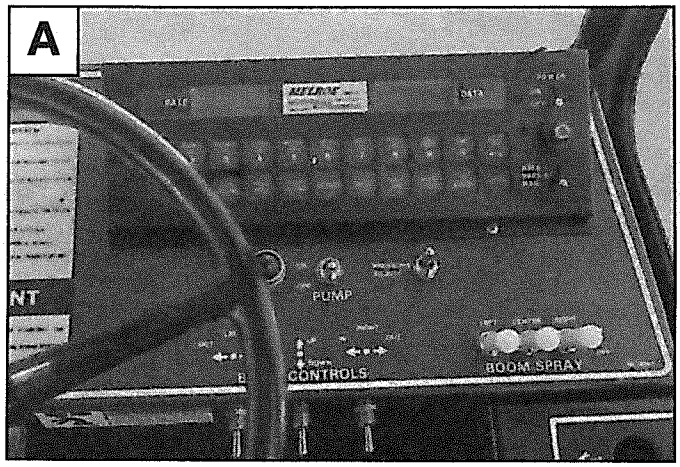
TOW HITCH 83

WIDE FRONT (220-78") 80

Spra-Controller
(Manufactured to Melroe Specifications by RAVEN INDUSTRIES, INC.)

The Melroe Spra-Controller **[A]** is available as an accessory or factory option. The Spra-Controller is a computer-based control console which automatically maintains the flow regardless of speed or gear selection. A manual override switch allows the operator to manually control flow for spot spraying. Actual gallons per acre being applied is displayed at all times.

The Spra-Controller additionally functions as an acre monitor, speed monitor, gallonage totalizer, and tip monitor.



P-1808

Wide Front (220-78")

A suspension wide front **[A]** is available as an accessory or factory installed option.

The wheel spacing (from center to center of tires) is adjustable in 4" (10.16cm) increments from 80" (203.2cm) to 108" (274.3cm).

Air Conditioning

Air conditioning **[B]** is available as an accessory of factory installed option.

The evaporator and temperature control incorporate into the overhead blower unit, standard on the Spra-Coupe.

Activated Carbon Filter

The activated carbon filter **[C]** is available and adapts into the overhead blower behind the original standard filter.

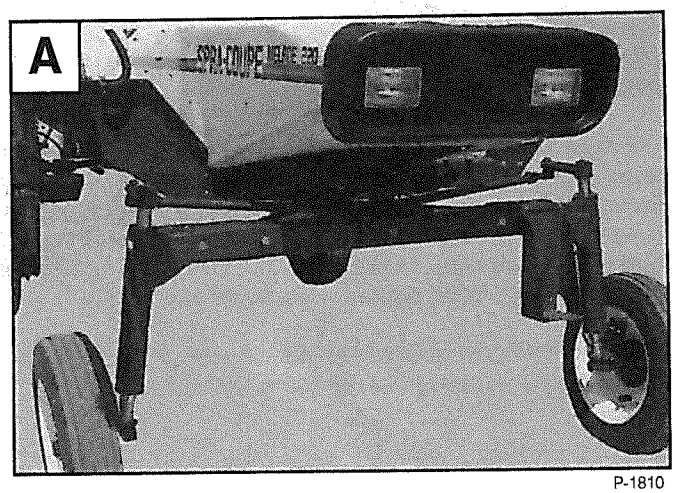
The filtering material is a very high quality activated carbon which restricts odors from entering the cab through the blower.

Crop Deflectors

Crop deflectors **[D]** are available through your Spra-Coupe dealer. **(Used with standard 7.50 x 16" Wrangler Mud Grip tires only.)**

When installed, the deflectors will guide the plant to the side, providing a clear path for the tires between the rows, minimizing damage.

The front deflector (available for single front only) can be lifted and pinned, allowing installation of the tow hitch for transport as shown.



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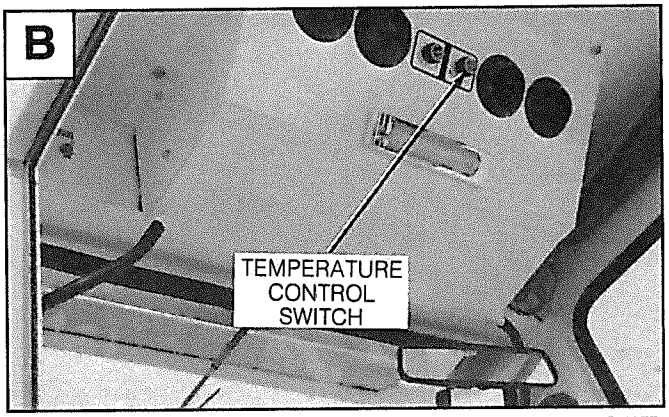

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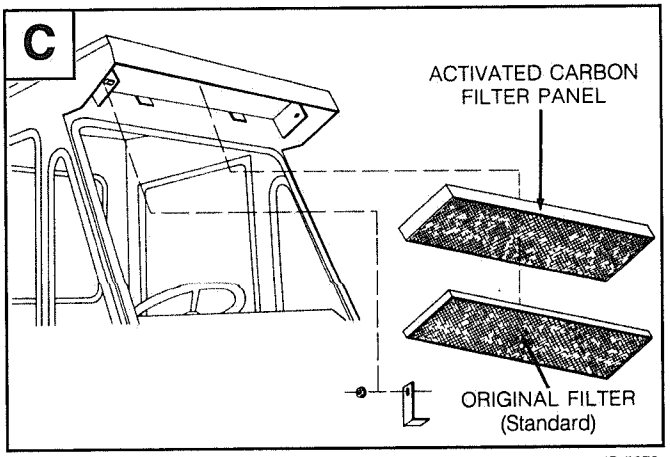

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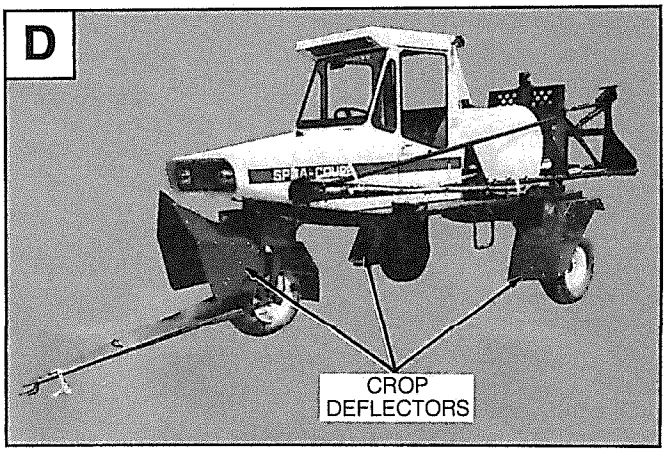

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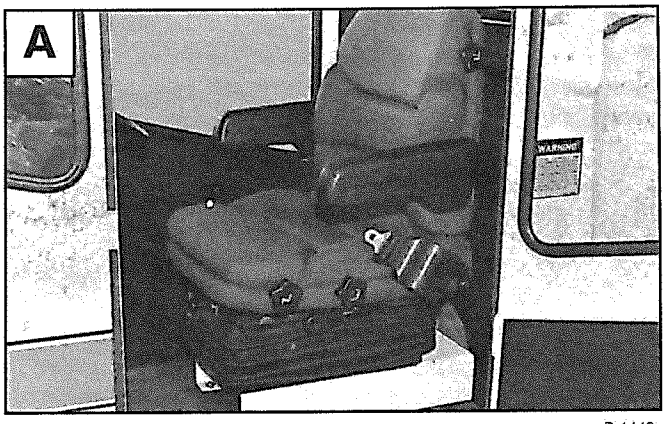
Deluxe Suspension Seat

A deluxe suspension seat **[A]** is available as an accessory or factory option.

The seat adjusts forward and rearward with an additional adjustment for suspension, back rest and height.



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Cab Insulation

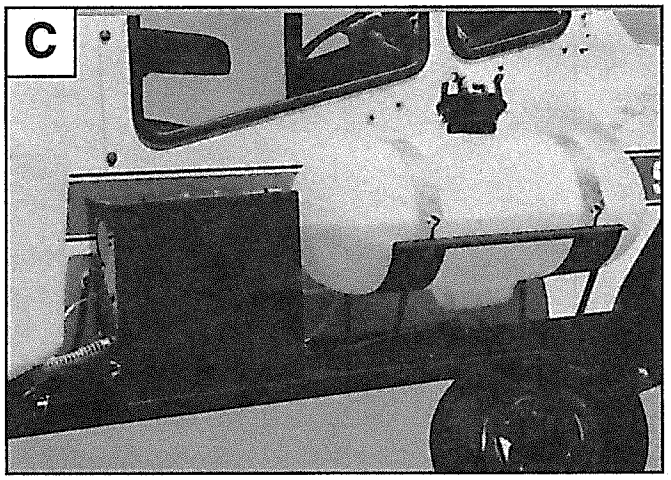
Cab insulation **[B]** is available as a factory option.

P-1330

Foam Marker

A foam marker kit **[C]** is available as an accessory from your Spra-Coupe dealer.

A switchbox mounted inside the cab will provide the operator with boom selection for foam application. The collector attaches to the end of the boom and drops a ball of foam at the adjusted rate, marking for the return pass made with the Spra-Coupe.

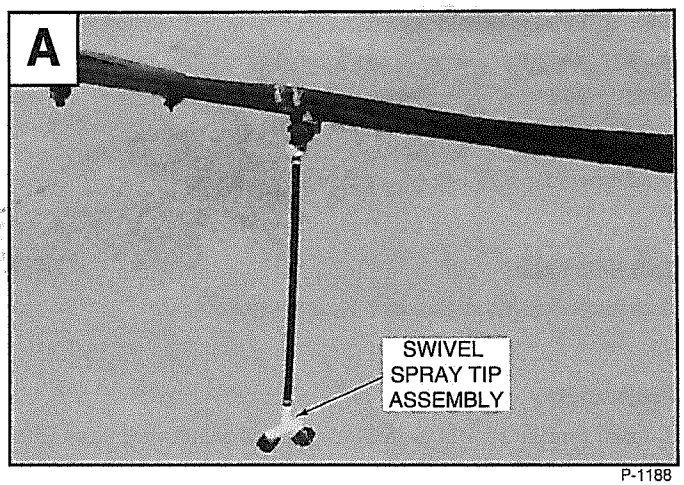


P-1618

Drop Nozzle

Drop nozzle kits **[A]** are available through your Spra-Coupe dealer. The spray tip assembly swivels allowing direct spraying applications. (Caps included in the kit less the spray tips and screens.)

The hose drop kit is easy to attach and turns directly onto the existing nozzle assembly as shown.

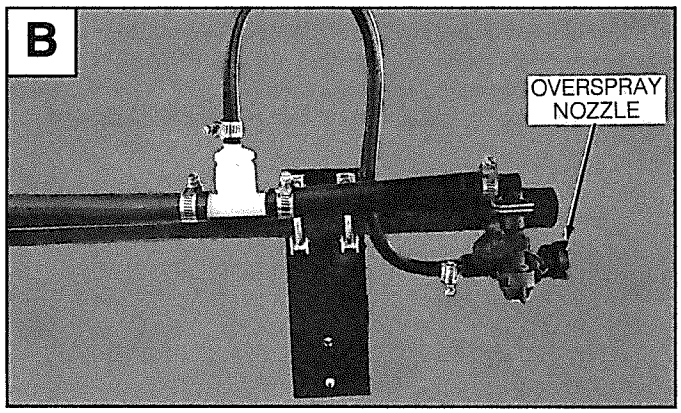


P-1188

Overspray Nozzles

Overspray nozzles **[B]** are available from your Spra-Coupe dealer as an accessory. An in-line valve is supplied to shut off the liquid flow to the nozzles if desired.

The overspray nozzles are not recommended for use in spraying contact herbicides due to the larger droplets produced.



P-1490

Hand Sprayer

A hand sprayer kit **[A]** is available from your Spra-Coupe dealer and used to spray small and hard to get to areas.

Nozzles and Screens

Various screens and nozzle tips (in brass or stainless steel) are available to obtain the various application rates desired.

Blank tips are also available to block off the desired nozzles during application.

Flood Light Kit

Flood lights **[B]** are available from your Spra-Coupe dealer to illuminate the booms and nozzles during night spraying.

Rear Extension Axle

A rear extension axle kit **[C]** (with or without the constant velocity joints) is available from your Spra-Coupe dealer.

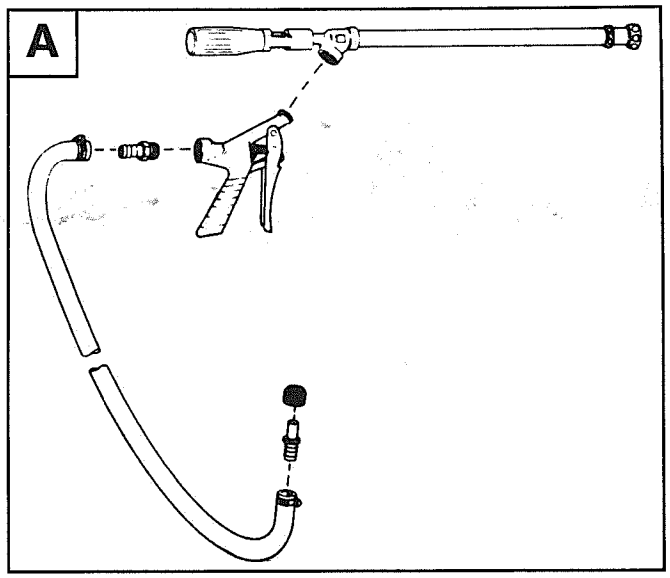
On the Model 220-72" Spra-Coupe, the extension axle will obtain tread widths from 90" (228.6cm) to 99.25" (252.1cm).

On the Model 220-78" Spra-Coupe, the extension axle will obtain tread widths from 96" (243.8cm) to 120.75" (306.7cm).

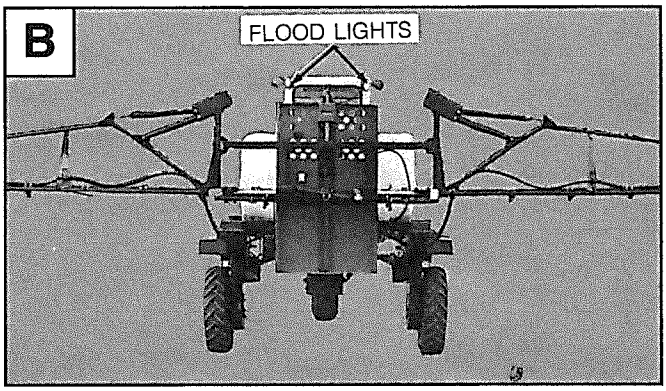
See page 29 for additional information.

Tow Hitch

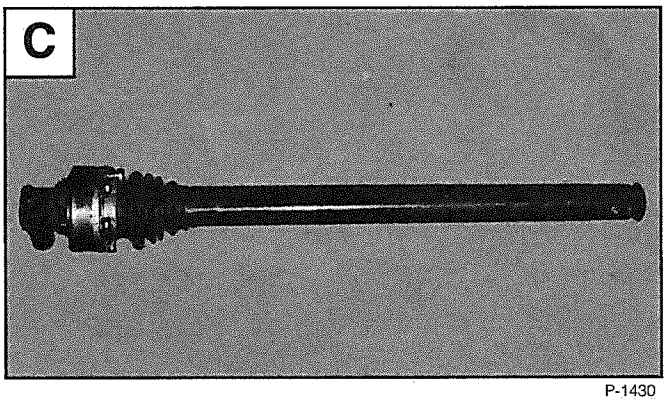
A tow hitch for the single front **[D]** (and wide front) is available as an accessory from your Spra-Coupe dealer and is to be used to tow the Spra-Coupe.



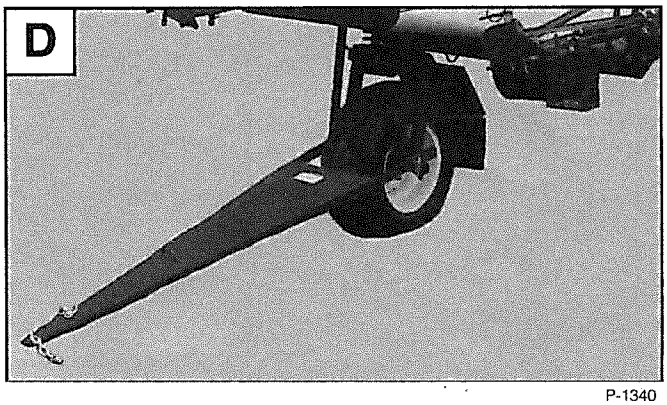
B-5190



P-1210

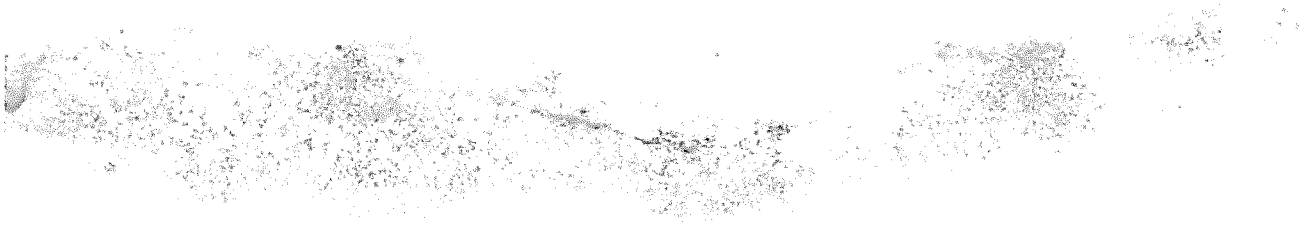


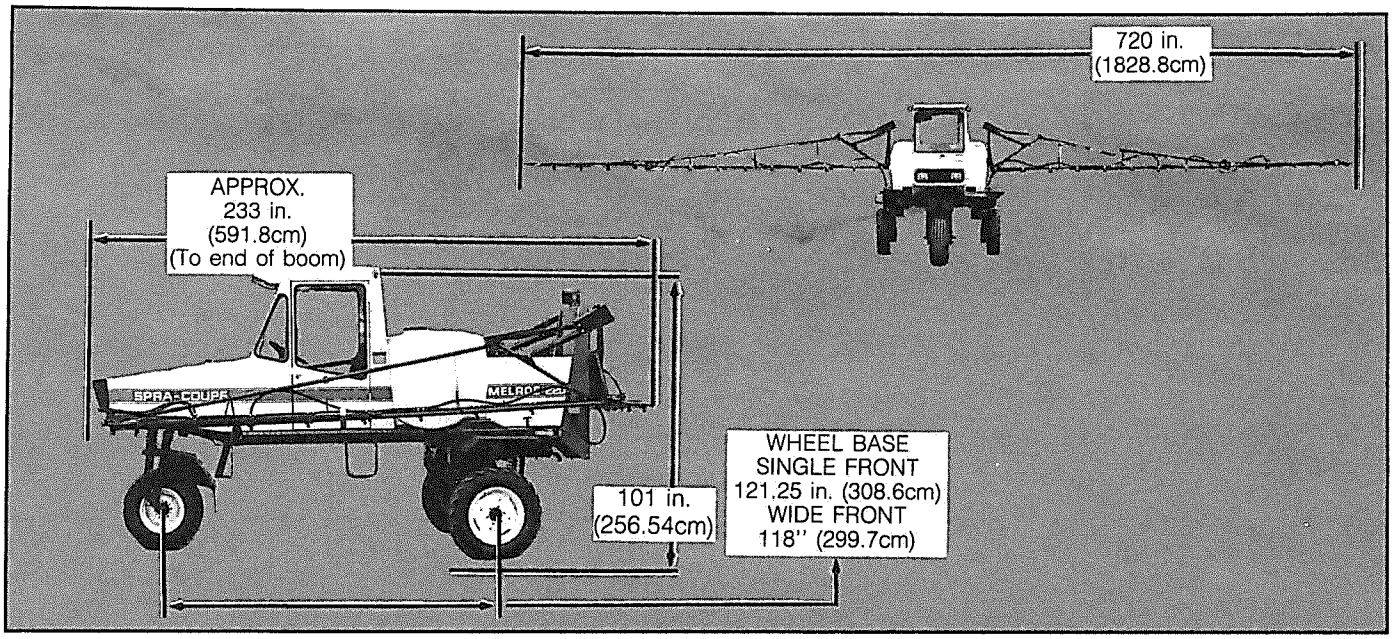
P-1430



P-1340

SPECIFICATIONS





MODEL 220 SPRA-COUPE
SPECIFICATIONS
(Specifications and Design is subject to change without notice)

GENERAL SPECIFICATIONS

Shipping Weight (220-78") lbs. (kg.) (Does not consider optional equipment. Weight will be more if equipped with options) . . . . Approx. 4550 (2066)
Shipping Weight (220-72") (Does not consider optional equipment. Weight will be more if equipped with options) . . . . . Approx. 4675 (2122)
Operating Weight (220-78") lbs. (kg.) (With spray tank full) (Weight will be more if equipped with options) . . . . . Approx. 6305 (2861)
Operating Weight (220-72") lbs. (kg.) (With spray tank full) (Weight will be more if equipped with options) . . . . . Approx. 6428 (2918)
Speed Ranges — mph & (km/h)(with Standard Rear 7.50x16 "General" Mud Grip Tires) 5.0 (8.0), 9.2 (14.8), 14.6 (23.5), 21.5 (34.6)
Tires (Standard) . . . . . 11Lx15 Imp. Rib. (Front) Inflate to 26-30 psi (179-207 kPa)
7.50x16 "General" Mud Grip (Rear) Inflate to 60 psi (413 kPa)
Tires (Optional) . . . . . 29x12.50 - 15 Bar Lug (Rear) Inflate to 30 psi (207 kPa)
29x12.50 - 15 Xtra-Traction Flotation (Rear) Inflate to 25-30 psi (172-207 kPa)
31x13.50 - 15 Lt Rib (Rear) Inflate to 30 psi (207kPa)
Rear Suspension . . . . . Swing Type-Coil Springs and Shock Absorber
Front Suspension . . . . . Wheel Fork-Coil Spring and Shock Absorber
Tread Spacing (rear) 220-72" - in. (cm) . . . . . 72 (182.9) to 87.25 (221.6) w/rims reversed
Tread Spacing (rear) 220-78" - in. (cm) . . . . . 78 (198.1) to 101.25 (257.2) w/rims reversed
Tread Spacing (Wide Front 220-72") in. (cm.) . . . . . 72 (182.9) to 96 (243.8)
Tread Spacing (Wide Front 220-78") in. (cm.) . . . . . 80 (203.2) to 108 (274.8)

ENGINE

Make . . . . . 75 H.P. 1.8 Liter Volkswagen-Industrial, Water Cooled
Type . . . . . 026.2, 4 Cylinder, 1781 cc Displacement - 108.6 cu. in.
Governed Operating RPM . . . . . 3800 No-Load - 800 Low Idle
Fuel . . . . . Regular Gasoline, not lower than 87 Oct.
Fuel Tank Capacity — gallons (litres) 22 (83.27)
Engine Oil Capacity — quarts (litres) 3.2 (3.03)
Engine Oil . . . . . SAE 15W-40 SF/CD or equivalent to Mil-L-2104D. (Ambient Temp. range from 0°F (−18°C) to 92°F (33°C). See page 30 for other recommendations)

TRANSMISSION

Type . . . . . Heavy Duty, Synchromesh Transaxle, 4 Speeds Forward and 1 Reverse
Transmission Oil Capacity - pints (litres) 5.3 (2.507)
Final Drive . . . . . 1:3.5, No. 60 Chain, Chain Sprockets and Roller Chain Running in Oil, Left and Right Hand
Final Drive Oil Capacity - pints (litres) 9 (4.26)

SPRAYING SYSTEM

Spray Control . . . . . Electric "Left - Center - Right" Boom On/Off Spray Control Valves
Flow Control . . . . . Electric Control Pressure Adjust Valve
Agitation . . . . . Offset Jet Agitator Inside Tank
Liquid Tank — gallons (litres) 210 (796.1)
Sprayer Pump . . . . . Centrifugal 130 Max. psi With H.D. Electric Clutch
Filtration . . . . . Pump Outlet Strainer w/40 Mesh Screen
Sprayer Manifolds and Feed Lines . . . . . 36 Nozzle Jet Assemblies With 80° 8002 Brass Tip w/50 Mesh Screen Standard

BOOMS

Boom Controls . . . . . Hydraulic "Tip Lift" — "Fold/Unfold" — "Raising/Lowering"
Boom Height — in. (cm) . . . . . Approx. 22 (55.9) to 64 (162.6)
Boom Width — ft. (m) 60 (18.3)
Nozzle Spacing — in. (cm) . . . . . 20 (50.8 Standard)

A BUSINESS UNIT OF CLARK EQUIPMENT COMPANY

L-K Fackler RD.

760-5493 cel

623-6879

Larry Bohnke

METRIC MEASUREMENTS

Shown below are the common measurements used in the International System of Units (SI) and the corresponding U.S. and British equivalents.

LENGTH

1 millimeter (mm) = 0.039 inch
1 centimeter (cm) = 0.393 inch
1 meter (m) = 3.281 feet; 1.093 yards
1 kilometer (km) = 0.621 mile

1 inch = 25.4 millimeters; 2.54 centimeters
1 foot = 0.305 meter; 30.48 centimeters
1 yard = 0.914 meter; 91.4 centimeters
1 mile = 1.609 kilometers; 1609 meters

AREA

1 square centimeter (cm^2) = 0.155 sq. in.
1 square meter (m^2) = 10.764 sq. feet; 1.196 sq. yards
1 hectare (ha) = 2.471 acres; 10,000 m^2
1 square kilometer (km^2) = 0.386 sq. mile; 247.11 acres

1 sq. inch = 6.45 sq. centimeters
1 sq. foot = 0.093 sq. meter; 929 sq. centimeters
1 sq. yard = 0.836 sq. meter; 8361 sq. centimeters
1 acre = 0.405 hectare; 4047 sq. meters
1 sq. mile = 2.589 sq. kilometers; 258.9 hectares

VOLUME

1 cubic centimeter (cm^3) = 0.061 cu. inch
1 cubic decimeter (dm^3) = 61.023 cu. inches; 0.035 cu. foot
1 cubic meter (m^3) = 35.314 cu. ft.; 1.307 cu. yd.; 28.378 bu.
1 liter (L) = 0.264 U.S. gallon; 1.056 U.S. quarts; .219 Imp. gallon; 0.879 Imp. quarts; 61.024 cu. inches; 1000 cm^3

1 cu. inch = 16.387 cu. centimeters; 0.016 liter
1 cu. foot = 28.316 cu. decimeters; 28.32 liters
1 cu. yard = 0.764 cu. meter; 764 liters
1 quart (U.S.) = 0.946 liter
1 quart (British) = 1.136 liters
1 gallon (U.S.) = 3.785 liters
1 gallon (British) = 4.545 liters

MASS (WEIGHT)

1 gram (g) = 0.035 ounce
1 kilogram (kg) = 2.205 pounds
1 metric ton (1000 kg) = 2.205 pounds

1 ounce = 28.35 grams
1 pound = 0.454 kilogram
1 ton (2,000 lb.) = 0.907 metric ton

VELOCITY

1 kilometer per hour (km/h) = 0.621 mile per hour
1 mile per hour = 1.609 kilometers per hour

POWER

1 kilowatt (kw) = 1.341 horsepower
1 horsepower = 0.746 kilowatt

PRESSURE

1 psi = 6.89 kPa - kilopascal, 0.00689 MPa - Megapascal

TORQUE

1 lb. (force) – ft. = 1.356 N'm
1 lb. (force) – in. = .113 N'm

COMMON MEASUREMENTS

U.S. Government Land Measure

A township — 36 sections, each a mile square.

A section — 640 acres.

A quarter section — half a mile square, 160 acres.

An eighth section — half a mile long, north and south, and a quarter of a mile wide — 80 acres.

A sixteenth section — a quarter of a mile square — 40 acres.

The sections are all numbered 1 to 36, commencing at the north-east corner.

The sections are divided into quarters, which are named by the cardinal points. The quarters are divided in the same way. The description of a forty-acre lot would read: The south half of the west half of the southwest quarter of section 1 in township 24, north of range 7 west, or, as the case might be, and sometimes will fall short and sometimes overrun the number of acres it is supposed to contain.

NOTE—In most of the Western states, where all of the land was laid out by the Government, all titles, except in city lots, are passed by description, as under the Government survey, and there a square of 6 miles, or 36 square miles, is one township.

Common Measures

Length

12 Inches . . . . . 1 Foot
3 Feet . . . . . 1 Yard
5½ Yards . . . . . 1 Rod
320 Rods . . . . . 1 Mile
1 Mile . . . . . 5,280 Feet

Area

144 Square In. . . . . 1 Sq. Ft.
9 Square Ft. . . . . 1 Sq. Yd.
30¼ Square Yd. . . . . 1 Sq. Rd.
160 Square Rd. . . . . 1 Acre
4,840 Sq. Yd. . . . . 1 Acre
43,560 Sq. Feet . . . . . 1 Acre
640 Acres . . . . . 1 Sq. M.
An acre is equal to a square whose side is 208.71 feet.

Volume

1728 Cu. Inches . . . . 1 Cubic Ft.
27 Cu. Feet . . . . . 1 Cubic Yd.
128 Cu. Feet . . . . . 1 Cord

Surveyor's Square Measure

10,000 Sq. Links . . . 1 Sq. Chain
10 Square Chains . . . . . 1 Acre
10 Chains Square . . . . . 10 Acres

Surveyor's Linear Measure

7.92 Inches . . . . . 1 Link
100 Links . . . . . 1 Chain
80 Chains . . . . . 1 Mile
(Gunther's chain is the unit and is 66 feet long)

Dry Measure

8 Quarts . . . . . 1 Peck
4 Pecks . . . . . 1 Bushel
1 Bushel contains 2150.42 cubic inches or approximately 1¼ cubic feet.

Liquid Measure

2 Pints . . . . . 1 Quart
4 Quarts . . . . . 1 Gallon
1 Gallon contains 231 cu. in.
1 Cubic Ft. equals 7½ gals.

Engine - VW ADF-026, 2

Transaxle - VW Type 1 IRS

Swap - Type 4 1.8?

6629532 (Rev. 10-94) 7C-IP

IMAGE PRINTING

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